

राजेन्द्र आयुर्विज्ञान संस्थान

(झारखण्ड सरकार का एक स्वयतशासी संस्थान)

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कार्यालय सूचना

पीएच०डी० कोर्स सत्र 2024 हेतु दिनांक 05.04.2025 को आयोजित की गई प्रवेश परीक्षा की MCQ एवं Answer Sheet इस के साथ संलग्न कर प्रकाशित की जा रही है किसी भी परीक्षार्थी को इस संबंध में कोई आपत्ति/दावा दर्ज करनी हो तो वे पत्र निर्गत की तिथि से 07 दिनों के अन्दर justification के साथ अपना आपत्ति/दावा डीन रिसर्च रिम्स, राँची के कार्यालय में ईमेल के माध्यम से प्रेषित करेंगे उक्त निर्धारित तिथि के पश्चात् किसी का भी आपत्ति/दावा में कोई संज्ञान नहीं लिया जाएगा।

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संलग्नक- पत्रानुसार।

डीन रिसर्च

-सह-

अध्यक्ष पीएच०डी० समन्वय समिति

रिम्स, राँची
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PhD ENTRANCE EXAM [Session-2024]**Rajendra Institute of Medical Sciences, Ranchi**

Roll No:

Answer Sheet Number:

Full Name:

Mobile Number and Email ID:

Signature of Candidate:

Signature of Invigilator:

Number of Questions: Part A - 50 & Part B-50

Time: 2 hours | Maximum Marks: 100

Number of pages in this Booklet: 13**Please Read these instructions carefully:**

1. Tally the number of pages and number of questions in the booklet with the information printed on the cover page.
2. Faulty booklets will be replaced immediately by a correct booklet by the invigilator concerned within 5 minutes. Thereafter neither booklet will be replaced nor will any extra time be given.
3. Use Blue or Blue Black Ball point pen only.
4. Please follow the instructions carefully for marking correct answer in OMR answer sheet given at the back of OMR sheet.
5. Each question carries one mark and there is no negative marking for wrong answer.

BOOKLET NUMBER	SUBJECT NAME MEDICAL	SUBJECT CODE 01
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RIMS, PhD ENTRANCE EXAM [Session-2024]**Part-A: RESEARCH METHODOLOGY**

1) To test the association of diabetes on kidney disease, 100 kidney disease patients and 100 healthy (no kidney disease) persons were recruited. There were 30% and 10% diabetic persons in disease and healthy group's, study design is:

- A) Case control study
- B) Cross sectional study
- C) Cohort study
- D) Randomized controlled trials

2) What is the best design to study the prevalence of a disease?

- A) Cross-sectional study
- B) Case-control study
- C) Cohort study
- D) Randomized controlled trials

3) Which type of study is loosely structured and designed to expand understanding of a topic and provide insights

- A) Formal
- B) Causal
- C) Exploratory
- D) Descriptive

4) All of the following are possible goals of an exploratory study EXCEPT.....

- A) Discover future research tasks
- B) Expand understanding of a topic
- C) Test hypotheses
- D) Provide insight

5) All of the following are true for Case study EXCEPT..

- A) Usually on rare disease /condition
- B) Descriptive study
- C) Observational study
- D) Statistical significance

6) Which of the following sections of a protocol includes the description of study population, sample size and sampling

- A) Introduction
- B) Methods
- C) Objectives
- D) Expected Benefits

7) The research is always –

- A) Verifying the old knowledge
- B) Exploring new knowledge
- C) Filling the gap between knowledge
- D) All of these

8) Which of the following is NOT a characteristic of a well-designed Randomized Controlled Trials (RCT)?

- A) Random assignment of participants to treatment and control groups
- B) Blinding of participants and researchers for treatment allocation
- C) Use of a pre-determined sample size
- D) Inclusion of participants using snowball sampling

9) Complete the statement. A written plan detailing the proposed implementation of a research study is known as

- A) Manuscript
- B) Protocol
- C) Commentary
- D) Critical appraisal

10) Which of the following is an example of artificial intelligence?

- A) Manufacturing robots.
- B) Virtual travel booking agent.
- C) Self-driving cars.
- D) All of the above

11) A researcher wishes to estimate the incidence of Myocardial infarction cases among a group of women using Oral Contraceptive Pills (OCP) who have been followed up for 10 years. Which of the following study designs is best suitable for this?

- A) Case series
- B) Cohort study
- C) Cross sectional survey
- D) Ecological study

12) Which of the following study designs can be used to determine the factors associated with a health-related outcome?

- A) Descriptive cross-sectional study
- B) Analytical cross-sectional study
- C) Case study
- D) Case series

13) If your objective is to estimate the prevalence of a health problem in a community in 2021, which of the following would most likely be the type of research question?

- A) Analytical research question
- B) Descriptive research question
- C) Hypothetical research question
- D) Experimental research question

14) Complete the statement. A study design that randomly assigns participants into an experimental group or a control group is known as

- A) Cohort study
- B) Case-control study
- C) Randomized controlled trials
- D) Cross-sectional study

15) The mean of a distribution is 14 and the standard deviation is 5. What is the value of the coefficient of variation?

- A) 60.40%
- B) 48.30%
- C) 35.70%
- D) 27.80%

16) The mean of a distribution is 23, the median is also 23. It is most likely that this distribution is:

- A) Positively Skewed
- B) Symmetrical
- C) Negatively Skewed
- D) None of above

17) Which of the following describe the middle part of a group of numbers?

- A) Measure of Variability
- B) Measure of Central Tendency
- C) Measure of Association
- D) Measure of Shape

18) According to the empirical rule, approximately what percent of the data should lie within ± 2 SD

- A) 75%
- B) 68.20%

- C) 99.70%
- D) 95.40%

19) Which of the following is a measure of central tendency?

- A) Percentile
- B) Quartile
- C) Standard deviation
- D) Mode

20) Which of the following divides a group of data into four subgroups?

- A) Percentiles
- B) Deciles
- C) Median
- D) Quartiles

21) If the standard deviation of a population is 9, the population variance is:

- A) 9
- B) 3
- C) 21
- D) 81

22) The sum of the deviations about the mean is always:

- A) Zero
- B) Total Standard Deviation
- C) Positive
- D) Negative

23) What is the appropriate measure of dispersion if mean is reported as the measure of central tendency for a given set of data?

- A) Standard deviation
- B) Interquartile range
- C) Variance
- D) Coefficient of variation

24) Parameter is a measure which is computed from

- A) Population data
- B) Sample data
- C) Test statistics
- D) None of these

25) The height of a student is 60 inches. This is an example of -

- A) Qualitative data
- B) Categorical data
- C) Continuous data
- D) Discrete data

26) Which of the following is not included in the background section of a concept paper.

- A) Importance of a health problem
- B) Known facts about the health problem
- C) Prior contribution of the researcher in the topic
- D) Knowledge gap in the topic

27) Which of the following sections of a protocol includes the details regarding data quality assurance?

- A) Data collection
- B) Data analysis
- C) Project implementation
- D) Data entry

28) Which of the following method is not a method of Decision Tree ?

- A) Classification and Regression Trees (CART)
- B) Chi-square automatic interaction detection (CHAID)

- C) Analysis of variance Trees
- D) Quick, Unbiased, Efficient Statistical Trees

29) Which of the following helps to minimize random error in a research study?

- A) Limited study duration
- B) Adequate sample size
- C) Adequate budget
- D) More number of investigators

30) Best way to study relationship between two continuous variables is:

- A) Bar Chart
- B) Histogram
- C) Pie Chart
- D) Scatter Diagram

31) When frequency of a variable is given in form of mild, moderate and severe, the data scale used is:

- A) Nominal
- B) Ordinal
- C) Interval
- D) Ratio

32) Which of the following is not a continuous variable?

- A) Height
- B) Weight
- C) Temperature
- D) Parity

33) If Arithmetic Mean=25 and Geometric Mean=15 then Harmonic Mean is:

- A) 25
- B) 5
- C) 9
- D) 15

34) Which of the following is a nominal variable?

- A) Blood sugar level
- B) Blood type (A, B, AB, O)
- C) Severity of Pain (Mild, Moderate, Severe)
- D) Hemoglobin level

35) Population census is conducted through

- A) Sample survey
- B) Accounting
- C) Investigation
- D) Complete enumeration

36) The value of coefficient of correlation lies between

- A) 0 to -1
- B) 0 to 1
- C) 1 to -10
- D) -1 to 1

37) Which of the following is a True statement?

- A) Coefficient of variation = $(S.E. / \text{Mean}) \times 100$
- B) Interquartile Range is difference of minimum and maximum value of a data set
- C) Standard deviation = Square of variance
- D) Standard deviation is always \geq Std error

38) As sample size increases, standard deviation of sample means:

- A) Decreases
- B) Increases

- C) Remains the same
- D) Approaches to infinity

39) All of the following statements are true, EXCEPT:

- A) Sample size is necessary to achieve statistical significance.
- B) Sample size is essential to achieve medical significance.
- C) A statistically significant result may and may not be medically significant.
- D) Larger the sample size, more is the chance of getting statistical significance.

40) All the following are Random Sampling Methods EXCEPT:

- A) Simple Random Sampling
- B) Stratified Sampling
- C) Cluster Sampling
- D) Quota Sampling

41) The square of the correlation coefficient, the value represents:

- A) The strength of the non-linear relationship between two variables
- B) The risk ratio between two variables
- C) Odds ratio
- D) The proportion of variation in the dependent variable that can be explained by the independent variable

42) The major advantage of a probability sample compared to a non-probability sample is that:

- A) It saves time
- B) It costs less
- C) It enables to compute average value
- D) Sampling error can be estimated.

43) Incidence is defined as:

- A) Number of new cases occurring during a specified period in given population
- B) Number of old cases present during a specified period in given population
- C) Number of cases occurring in a given population
- D) Number of cases existing in a given population at a given time

44) The difference between sample estimate and population parameter is known as:

- A) Standard error
- B) Sampling error
- C) Absolute error
- D) Sampling variance

45) Log-rank test is a hypothesis test for comparing the survival distributions of two or more groups, used in?

- A) Life table
- B) Cox regression model
- C) Kaplan Meier method
- D) All of the above

46) Which method is used to calculate the probability of survival for each of equal interval time ?

- A) Life table
- B) Kaplan Meier Method
- C) Cox regression
- D) Linear regression

47) Which of the following technique is used for exploring the relationship between the survival time of patients and covariates?

- A) Life table
- B) Cox regression model
- C) Kaplan Meier method
- D) All of the above

48) Hazard ratio is calculated in

- A) Life table
- B) Cox regression model

- C) Kaplan Meier method
- D) All of the above

49) The receiver operating characteristic (ROC) curve is plotted between

- A) Sensitivity & False negative rate
- B) Sensitivity & False positive rate
- C) Sensitivity & Specificity
- D) Specificity & False positive rate

50) Which of the following measure should be used to test the ability of a diagnostic test to correctly classify an individual as 'Negative' when he has no disease?

- A) Sensitivity
- B) Specificity
- C) False positive rate
- D) False negative rate

RIMS, PhD ENTRANCE EXAM [Session-2024]**Part-B: MEDICAL**

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- 51) What structural feature of cardiac myocytes is primarily responsible for initiating calcium-induced calcium release?
- A) Ion transport through sodium-calcium exchange proteins.
 - B) Cyclic bridges formed by actin and myosin filaments.
 - C) Myosin head activity driven by ATP molecules.
 - D) The close positioning of T tubules and sarcoplasmic reticulum.
- 52) What is the role of phospholamban in adrenergic stimulation?
- A) It enhances calcium absorption into the sarcoplasmic reticulum.
 - B) It directly controls L-type calcium channel formations.
 - C) It boosts the cycling actions of myosin cross-links.
 - D) It aids in calcium releases from SR to trigger contractions.
- 53) What is the primary purpose of tight junctions between tubular cells in the renal tubule?
- A) To promote energy-dependent transit of molecules across membranes.
 - B) To form aquaporins that control selective water movement.
 - C) To obstruct passive movement of water and solutes across barriers.
 - D) To enhance active transport effectiveness within tubular structures.
- 54) How does the NaPiIIa co-transporter contribute to renal function?
- A) Balancing levels of potassium together with chloride transportation.
 - B) Activating water aquaporins to enhance molecular movement flow.
 - C) Facilitating sodium-linked phosphate uptake vital for body systems.
 - D) Regulating the sodium ion secretion back into tubular Fluid
- 55) Which feature is pivotal to differentiate post-hemorrhagic anaemia from hemolytic anaemia?
- A) The reticulocyte count raises gradually following blood volume losses.
 - B) LDH concentrations consistently avoid fluctuations despite conditions.
 - C) Hemoglobin levels persist unchanged immediately after bleeding ends.
 - D) The bilirubin increase initiates without direct and initial stimuli.
- 56) What is the main cause of hypotension in patients on ACE inhibitors during blood transfusion?
- A) The elevation of calcium concentration in the patient's blood.
 - B) The release of bradykinin from interaction with surfaces.
 - C) The alteration in hemoglobin caused by transfused blood.
 - D) The activation and clumping of platelets during the process.
- 57) What risk is associated with quinolone antibiotics in pediatric patients?
- A) Potential structural damage to tendons during treatment
 - B) Bone marrow suppression related to immune response
 - C) Severe allergic reactions causing systemic shock risk
 - D) Kidney toxicity impairing patient renal system health
- 58) Which pathogen is associated with bullous myringitis and other upper respiratory infections?
- A) Mycoplasma pneumonia bacteria affecting ears and respiratory
 - B) Haemophilus influenzae linked to ear infections frequently
 - C) Coxiella burnetii known to cause Q fever conditions
 - D) Rickettsia rickettsii transmitted by tick vectors commonly
- 59) When one lung exhibits decreased tactile fremitus, what could this finding suggest about the lung?

- A) Normal lung structure with no particular condition
 - B) Accumulated fluid preventing vibrations conducting sound
 - C) Partial lung collapse limiting external tactile feedback
 - D) Consolidation leading to denser tissue vibration sound
- 60) What is the key difference between Berman and Guedel airways?
- A) Both systems are functionally identical in airway upkeep.
 - B) Berman permits intubation, Guedel does not enable that.
 - C) Berman provides single-use options
 - D) Guedel allows reuse.
- 61) What therapy is given preoperatively to reduce carcinoid crises in patients with a history?
- A) Administering octreotide, a synthetic somatostatin analogue.
 - B) Antihypertensive drugs as standard preventative medication.
 - C) Daily measured insulin injections to regulate glucose levels.
 - D) High-dose vitamin D intake for systemic hormonal balance.
- 62) What clinical finding primarily triggers the use of vasopressin receptor antagonists?
- A) Extreme thirst resulting from insipidus-diabetes condition
 - B) Hyponatremia arising from inappropriate ADH hormone secretion
 - C) Hypokalemia leading to major leg muscle cramp symptoms
 - D) Hypermnatremia due to significant dehydration occurrence
- 63) Which laboratory finding indicates a diagnosis of adrenal insufficiency?
- A) Serum sodium higher than 145 mmol/L
 - B) ACTH hormone levels less than 50 pg/dL
 - C) Morning plasma cortisol concentration equal to or below 3 mg/dL
 - D) Elevated fasting plasma glucose above 120 mg/dL
- 64) What notable historical figure is associated with the mythology of liver regeneration?
- A) Prometheus, punished by Zeus as in Greek myths
 - B) Achilles, the famed Greek Trojan War soldier-hero
 - C) Hippocrates, the ancient Greek physician and thinker
 - D) Apollonius, a philosopher known for his teachings
- 65) What occurs in Crigler-Najjar syndrome affecting bilirubin metabolism in the liver?
- A) Hepatic dysfunction stems from degraded regulatory pathways
 - B) Breakdown discrepancy alters resulting red cell end-products
 - C) Defective enzyme coding causes improper or absent conjugation
 - D) Standard bilirubin processes occur but with excess bilirubin rise
- 66) What consequence arises when proton pump inhibitors interact with clopidogrel?
- A) Decreased active effectiveness through enzymatic competition
 - B) Complete annulment of complementary drug pair functionality
 - C) Interference blocks intestinal absorption efficiencies system-wide
 - D) Increased vascular coagulants impairing therapeutic aims entirely
- 67) Regarding coagulation factors, which is synthesized abundantly extrahaptically differing from liver-origin examples?
- A) von Willebrand factor predominantly made in endothelium
 - B) Protein C acting massively on blood anti-coagulative pathways
 - C) Fibrinogen molecules solely regulated through hepatic constructs
 - D) Major synthesis contributors arise forming intrinsic prothrombin
- 68) According to the Child-Pugh score, what are two subjective components that may fluctuate with treatment?
- A) Bilirubin content and albumin protein serum metrics
 - B) Prothrombin clot timing and INR coagulation properties
 - C) Enzyme release levels reflecting overall liver functionality
 - D) Encephalopathy severity and observed levels of ascites
- 69) What is a commonly used tracer in Positron Emission Tomography (PET) for functional imaging?

- A) Gallium-68 derivative for radioactive imaging
- B) (18F) 2-Fluoro-2-deoxyglucose tracer usage
- C) (11C) Choline for metabolic tracer use
- D) Technetium-99m bone diagnostic tracer

70) What is cirrhotic cardiomyopathy characterized by?

- A) Decreased responsiveness to stress with QT prolongation
- B) Myocardial hypertrophy and ongoing sustained tachycardia
- C) Increased cardiac output with arterial hyperreflexia
- D) Diastolic dysfunction without electrophysiological abnormalities

71) What condition is uniquely identified by hypoxaemia worsening in an upright position?

- A) Pleural fluid accumulation linked with organ pressure imbalances
- B) Lung blood vessel constriction with liver-related hypertension
- C) Lung-related hepatic syndrome involving standing blood desaturation
- D) Heart dysfunction due to cirrhosis affecting contractions negatively

72) What is a non-invasive diagnostic tool recommended for fibrosis staging in NAFLD?

- A) Imaging with sound waves targeted through systems
- B) Conduct detailed scanning procedures with CT specs
- C) Test elasticity of liver through specific vibrations
- D) Measure organic performance using helpful markers

73) What is the genetic basis of Wilson's disease?

- A) Alterations detected in the HFE gene
- B) Mutations observed in the ATP7B gene
- C) Genetic variations in the CFTR gene
- D) Modifications present in the PHEX gene

74) What is another name for Von Gierke's disease listed in the context?

- A) Type III glycogen storage disease or GSD
- B) Fanconi syndrome metabolic disorder name
- C) Type VI glycogen storage disease GSD
- D) Type I glycogen storage disease or GSD

75) What is the purpose of the corpus callosum?

- A) Relay of vital sensory signals transmitted to cerebral areas
- B) Regulation of emotions through limbic specialized connections
- C) Uniting the brain's hemispheres ensuring seamless exchange
- D) Control of respiratory neural signaling essential for breathing

76) What is the mechanism behind intracranial pressure increase when elevated hydrostatic pressure arises?

- A) Recovery in cerebral autoregulation naturally balances pressure.
- B) Exacerbation of vasogenic cerebral edema contributes to pressure increases.
- C) Systemic blood pressure reduction significantly affects the response.
- D) Drained cerebrospinal fluid deficiency impedes volume control.

77) For patients with hypoxic cerebral insult, what mitigates elevated intracranial pressure?

- A) Reducing systemic pressure prevents vascular volume expansion effects.
- B) Increasing metabolic demands impairs cerebral autoregulatory balance.
- C) Promoting excessive arterial dilation worsens cerebral perfusion.
- D) Raising systemic tension levels activates vascular countermeasures.

78) Which MRI sequence is sensitive for detecting early stages of ischemia?

- A) T2-weighted imaging enhancing spatial tissue contrasts
- B) FLAIR imaging allowing sensitive edema visualization
- C) Diffusion-weighted imaging revealing cytotoxic swelling
- D) T1-weighted sequences displaying anatomical structure view

79) What distinguishes T1- from T2-weighted MRI imaging in terms of signal intensity?

- A) T1 shows cerebral spinal fluid dark, while T2 it appears light
 - B) Similar observations in both modalities due to shared contrasts
 - C) Bright appearance of fluids in T1, while in T2 fluids are dimmer
 - D) Contrast inversions in T1 and T2 with different water displays
- 80) What characterizes A waves in Lundberg's intracranial pressure waves?
- A) Instability in ICP with no significant alterations.
 - B) Modest ICP rises persisting for a few minutes.
 - C) Variations correlate with systemic blood changes.
 - D) Large ICP reductions over an extended period.
- 81) What condition is treated with hypertonic saline and possibly fludrocortisone?
- A) Assess moderate vasospasm cases with systematic approaches.
 - B) Address severe SIADH complications by different modalities.
 - C) Manage hyponatremia caused by extensive cerebral salt depletion.
 - D) Handle arrhythmic changes due to electrolyte imbalances.
- 82) What is a notable feature of Candida species fungemia?
- A) It occurs primarily in gastrointestinal contexts excluding bloodstream.
 - B) The condition is rare and mortality rates consistently below ten percent.
 - C) It is the fourth leading bloodstream infection in intensive care units.
 - D) It exclusively occurs in tropical or equatorial geographic regions.
- 83) Which bacterial pathogen has been most notably associated with colon carcinoma?
- A) It has associations with certain Salmonella species infections.
 - B) Connections exist with Staphylococcus aureus bloodstream identification.
 - C) This is frequently linked with particular Escherichia coli strains.
 - D) The colon carcinoma association is significant with Streptococcus bovis.
- 84) Which syndrome commonly results in Guillain-Barré Syndrome formation?
- A) Chronic unarrested bacterial neuropathy propagates gradual symptom increases.
 - B) Specific tuberculosis presenting meningitides prominently linked causatively.
 - C) A rapid viral meningitis coinciding central nervous system depictions.
 - D) Aseptic cerebrospinal inflammation presenting hallmarked protein elevation.
- 85) Which condition involves a high risk of corneal perforation?
- A) Acute viral conjunctivitis' effects may not threaten corneal integrity.
 - B) Hyperacute bacterial conjunctivitis can severely damage corneal health.
 - C) Chlamydial conjunctivitis presents symptoms dissimilar to conditions listed.
 - D) Allergic conjunctivitis normally does not result in significant risks.
- 86) Which parasitic infection is commonly linked to mediastinitis and eosinophilic myocarditis?
- A) Ascaris lumbricoides migration affecting internal thoracic tissues
 - B) Leishmania donovani leading to mediastinal and heart complications
 - C) Trypanosoma cruzi inducing eosinophilia and cardiac interactions
 - D) Filariae and Schistosomiasis nematodes causing eosinophilia-driven fibrosis
- 87) Which class of bacteria are primary contributors to chest wall infections such as empyema necessitans?
- A) Streptococcus Pneumoniae incidental in either latent or active cases
 - B) Anaerobic types e.g., Actinomyces forming invasive infectious occurrences
 - C) Mycoplasma strains minimally associated with thoracic invasiveness
 - D) Enteric Gram-negatives insufficiently linked to chest-specific infections
- 88) In the context of gastroenterology, what condition can intestinal tuberculosis cause that resembles typhoid fever?
- A) Gastrointestinal hemorrhage resembling infections strongly.
 - B) High bilirubin causing discoloration and symptoms.
 - C) Chronic inflammation leading to pancreatitis risks.
 - D) Protein loss through bowels affecting nutrition.
- 89) What is the importance of the CAST and cCAST scores in post-cardiac care?

- A) Tools for analyzing neurological results after cardiac management.
- B) Metrics to understand oxygen levels during resuscitative efforts.
- C) Guidelines for creating consistent cardiac response rules.
- D) Scales assessing nutritional needs of convalescing patients.

90) What does the term 'Foregoing of Life Support (FLST)' encompass?

- A) Observing patient directives and withholding interventions.
- B) Using medical consent for specific measures only.
- C) Applying DNAR and excluding withdrawal procedures.
- D) It involves stopping or not starting life supports and related procedures.

91) Which of the following is an example of a quasi-intentional tort?

- A) Acts causing physical harm intentionally.
- B) Wrongful statements leading to reputation harm.
- C) Forceful controlling someone against their will.
- D) Unauthorized entering someone else's property.

92) How does intravenous crystalloid over-resuscitation affect trauma patients?

- A) Improves prolonged circulatory system function positively permanently
- B) Facilitates notable recovery in standard respiratory parameters
- C) Induces abdominal syndromes and co-related patient morbidities
- D) Results in increased renal-related improvements and indications

93) When assessing a patient using an IVC measurement in shock evaluation, which characteristic determines method reliability?

- A) Always record data supine positioning without other methods
- B) Measurements during exhaling yield data reliability and standards
- C) Avoid sonography usage unless related imaging is unavailable
- D) Conduct readings solely below renal blood vessel indications

94) What is the primary challenge in diagnosing acute abdominal conditions in immunocompromised patients?

- A) The lack of specific diagnostic techniques for affected patients.
- B) Inherently elevated baseline leukocyte counts compared to others.
- C) Their immune system's inability to initiate an inflammatory response.
- D) Their consistently higher pain threshold than unaffected individuals.

95) What is a potential challenge when providing ABO-incompatible platelets?

- A) Platelets degrade rapidly during incompatibility transfusions.
- B) Platelets inherently lack any ABO antigens to cause issues.
- C) Antibodies in donor platelet plasma can influence red cells.
- D) Recipient cannot recognize the unique antigens on platelets.

96) What change occurs in INR when NSAIDs are taken with warfarin?

- A) INR decreases from NSAID-related factors affecting usage.
- B) NSAIDs impair warfarin's working without changing INR.
- C) INR remains unaltered, with no influence on bleeding levels.
- D) INR increases due to dual effects on bleeding mechanisms.

97) Under what circumstance is PTT not suitable for monitoring anticoagulation therapy?

- A) In individuals on a two-day anticoagulant schedule.
- B) In hemodialysis patients with coagulation variability.
- C) In cases of excess lipids causing assay distortions.
- D) In lupus anticoagulant patients with long PTT baselines

98) What monitoring approach is adequate for dabigatran anticoagulant therapy?

- A) Activated clotting time as a general gauge device.
- B) Partial thromboplastin time typical usage for lines.
- C) Anti-Xa assay based on assay-specific sensitivity.
- D) Diluted thrombin time to assess plasma inhibition

99) Which enzyme primarily metabolizes dobutamine?

- A) Catechol-O-methyltransferase operates metabolism in plasma pools.
- B) Monoamine oxidase is involved in neural transmitter processing.
- C) Acetylcholinesterase functions in synaptic neurotransmitter breakdown.
- D) Phosphodiesterase modulates circulatory messenger molecule levels.

100) What gas is employed in an intra-aortic balloon pump for its inflation and deflation during operation?

- A) Oxygen involves relations more towards biological consumables.
- B) Carbon dioxide's specifics suits alternate engineering purposes.
- C) Helium's unique properties accommodate its use under constraints.
- D) Nitrogen gases find varied applications unrelated to this tool.

Answer Key:-

Part - A Research Methodology				Part - B Medical			
S. No.	Key	S. No.	Key	S. No.	Key	S. No.	Key
1	A	26	C	51	D	76	B
2	A	27	C	52	A	77	A
3	C	28	C	53	C	78	C
4	C	29	B	54	C	79	A
5	D	30	D	55	A	80	B
6	B	31	B	56	B	81	C
7	D	32	D	57	A	82	C
8	D	33	C	58	A	83	D
9	B	34	B	59	B	84	D
10	D	35	D	60	D	85	B
11	B	36	D	61	A	86	D
12	B	37	D	62	B	87	B
13	B	38	A	63	C	88	A
14	C	39	B	64	A	89	A
15	C	40	D	65	C	90	D
16	B	41	D	66	A	91	B
17	B	42	D	67	A	92	C
18	D	43	A	68	D	93	B
19	D	44	B	69	B	94	C
20	D	45	C	70	A	95	C
21	D	46	A	71	C	96	D
22	A	47	B	72	C	97	D
23	A	48	B	73	B	98	D
24	A	49	B	74	D	99	A
25	C	50	B	75	C	100	C



Dean (Research)
Rajendra Institute of
Medical Sciences
Ranchi

Answer Key:-

Part - A Research Methodology				Part - B Nursing			
S. No.	Key	S. No.	Key	S. No.	Key	S. No.	Key
1	A	26	C	51	A	76	C
2	A	27	C	52	A	77	C
3	C	28	C	53	D	78	B
4	C	29	B	54	C	79	B
5	D	30	D	55	D	80	D
6	B	31	B	56	B	81	D
7	D	32	D	57	A	82	C
8	D	33	C	58	D	83	C
9	B	34	B	59	C	84	A
10	D	35	D	60	D	85	D
11	B	36	D	61	C	86	D
12	B	37	D	62	C	87	D
13	B	38	A	63	B	88	C
14	C	39	B	64	D	89	C
15	C	40	D	65	A	90	C
16	B	41	D	66	C	91	A
17	B	42	D	67	D	92	D
18	D	43	A	68	A	93	C
19	D	44	B	69	B	94	C
20	D	45	C	70	B	95	C
21	D	46	A	71	A	96	A
22	A	47	B	72	B	97	C
23	A	48	B	73	D	98	A
24	A	49	B	74	B	99	A
25	C	50	B	75	D	100	B

PhD ENTRANCE EXAM [Session-2024]

Rajendra Institute of Medical Sciences, Ranchi

Roll No:

Answer Sheet Number:

Full Name:

Mobile Number and Email ID:

Signature of Candidate:

Signature of Invigilator:

Number of Questions: Part A - 50 & Part B-50

Time: 2 hours | Maximum Marks: 100

Number of pages in this Booklet: 13

Please Read these instructions carefully:

1. Tally the number of pages and number of questions in the booklet with the information printed on the cover page.
2. Faulty booklets will be replaced immediately by a correct booklet by the invigilator concerned within 5 minutes. Thereafter neither booklet will be replaced nor will any extra time be given.
3. Use Blue or Blue Black Ball point pen only.
4. Please follow the instructions carefully for marking correct answer in OMR answer sheet given at the back of OMR sheet.
5. Each question carries one mark and there is no negative marking for wrong answer.

BOOKLET NUMBER	SUBJECT NAME NURSING	SUBJECT CODE 05
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RIMS, PhD ENTRANCE EXAM [Session-2024]**Part-A: RESEARCH METHODOLOGY**

-
- 1) To test the association of diabetes on kidney disease, 100 kidney disease patients and 100 healthy (no kidney disease) persons were recruited. There were 30% and 10% diabetic persons in disease and healthy group's, study design is:
- A) Case control study
 - B) Cross sectional study
 - C) Cohort study
 - D) Randomized controlled trials
- 2) What is the best design to study the prevalence of a disease?
- A) Cross-sectional study
 - B) Case-control study
 - C) Cohort study
 - D) Randomized controlled trials
- 3) Which type of study is loosely structured and designed to expand understanding of a topic and provide insights
- A) Formal
 - B) Causal
 - C) Exploratory
 - D) Descriptive
- 4) All of the following are possible goals of an exploratory study EXCEPT.....
- A) Discover future research tasks
 - B) Expand understanding of a topic
 - C) Test hypotheses
 - D) Provide insight
- 5) All of the following are true for Case study EXCEPT..
- A) Usually on rare disease /condition
 - B) Descriptive study
 - C) Observational study
 - D) Statistical significance
- 6) Which of the following sections of a protocol includes the description of study population, sample size and sampling
- A) Introduction
 - B) Methods
 - C) Objectives
 - D) Expected Benefits
- 7) The research is always –
- A) Verifying the old knowledge
 - B) Exploring new knowledge
 - C) Filling the gap between knowledge
 - D) All of these
- 8) Which of the following is NOT a characteristic of a well-designed Randomized Controlled Trials (RCT)?
- A) Random assignment of participants to treatment and control groups
 - B) Blinding of participants and researchers for treatment allocation
 - C) Use of a pre-determined sample size
 - D) Inclusion of participants using snowball sampling
- 9) Complete the statement. A written plan detailing the proposed implementation of a research study is known as

- A) Manuscript
 - B) Protocol
 - C) Commentary
 - D) Critical appraisal
- 10) Which of the following is an example of artificial intelligence?
- A) Manufacturing robots.
 - B) Virtual travel booking agent.
 - C) Self-driving cars.
 - D) All of the above
- 11) A researcher wishes to estimate the incidence of Myocardial infarction cases among a group of women using Oral Contraceptive Pills (OCP) who have been followed up for 10 years. Which of the following study designs is best suitable for this?
- A) Case series
 - B) Cohort study
 - C) Cross sectional survey
 - D) Ecological study
- 12) Which of the following study designs can be used to determine the factors associated with a health-related outcome?
- A) Descriptive cross-sectional study
 - B) Analytical cross-sectional study
 - C) Case study
 - D) Case series
- 13) If your objective is to estimate the prevalence of a health problem in a community in 2021, which of the following would most likely be the type of research question?
- A) Analytical research question
 - B) Descriptive research question
 - C) Hypothetical research question
 - D) Experimental research question
- 14) Complete the statement. A study design that randomly assigns participants into an experimental group or a control group is known as
- A) Cohort study
 - B) Case-control study
 - C) Randomized controlled trials
 - D) Cross-sectional study
- 15) The mean of a distribution is 14 and the standard deviation is 5. What is the value of the coefficient of variation?
- A) 60.40%
 - B) 48.30%
 - C) 35.70%
 - D) 27.80%
- 16) The mean of a distribution is 23, the median is also 23. It is most likely that this distribution is:
- A) Positively Skewed
 - B) Symmetrical
 - C) Negatively Skewed
 - D) None of above
- 17) Which of the following describe the middle part of a group of numbers?
- A) Measure of Variability
 - B) Measure of Central Tendency
 - C) Measure of Association
 - D) Measure of Shape
- 18) According to the empirical rule, approximately what percent of the data should lie within ± 2 SD
- A) 75%
 - B) 68.20%

- C) 99.70%
- D) 95.40%

19) Which of the following is a measure of central tendency?

- A) Percentile
- B) Quartile
- C) Standard deviation
- D) Mode

20) Which of the following divides a group of data into four subgroups?

- A) Percentiles
- B) Deciles
- C) Median
- D) Quartiles

21) If the standard deviation of a population is 9, the population variance is:

- A) 9
- B) 3
- C) 21
- D) 81

22) The sum of the deviations about the mean is always:

- A) Zero
- B) Total Standard Deviation
- C) Positive
- D) Negative

23) What is the appropriate measure of dispersion if mean is reported as the measure of central tendency for a given set of data?

- A) Standard deviation
- B) Interquartile range
- C) Variance
- D) Coefficient of variation

24) Parameter is a measure which is computed from

- A) Population data
- B) Sample data
- C) Test statistics
- D) None of these

25) The height of a student is 60 inches. This is an example of -

- A) Qualitative data
- B) Categorical data
- C) Continuous data
- D) Discrete data

26) Which of the following is not included in the background section of a concept paper.

- A) Importance of a health problem
- B) Known facts about the health problem
- C) Prior contribution of the researcher in the topic
- D) Knowledge gap in the topic

27) Which of the following sections of a protocol includes the details regarding data quality assurance?

- A) Data collection
- B) Data analysis
- C) Project implementation
- D) Data entry

28) Which of the following method is not a method of Decision Tree ?

- A) Classification and Regression Trees (CART)
- B) Chi-square automatic interaction detection (CHAID)

- C) Analysis of variance Trees
D) Quick, Unbiased, Efficient Statistical Trees
- 29) Which of the following helps to minimize random error in a research study?
- A) Limited study duration
B) Adequate sample size
C) Adequate budget
D) More number of investigators
- 30) Best way to study relationship between two continuous variables is:
- A) Bar Chart
B) Histogram
C) Pie Chart
D) Scatter Diagram
- 31) When frequency of a variable is given in form of mild, moderate and severe, the data scale used is:
- A) Nominal
B) Ordinal
C) Interval
D) Ratio
- 32) Which of the following is not a continuous variable?
- A) Height
B) Weight
C) Temperature
D) Parity
- 33) If Arithmetic Mean=25 and Geometric Mean=15 then Harmonic Mean is:
- A) 25
B) 5
C) 9
D) 15
- 34) Which of the following is a nominal variable?
- A) Blood sugar level
B) Blood type (A, B, AB, O)
C) Severity of Pain (Mild, Moderate, Severe)
D) Hemoglobin level
- 35) Population census is conducted through
- A) Sample survey
B) Accounting
C) Investigation
D) Complete enumeration
- 36) The value of coefficient of correlation lies between
- A) 0 to -1
B) 0 to 1
C) 1 to -10
D) -1 to 1
- 37) Which of the following is a True statement?
- A) Coefficient of variation = $(S.E. / \text{Mean}) \times 100$
B) Interquartile Range is difference of minimum and maximum value of a data set
C) Standard deviation = Square of variance
D) Standard deviation is always \geq Std error
- 38) As sample size increases, standard deviation of sample means:
- A) Decreases
B) Increases

- C) Remains the same
- D) Approaches to infinity

39) All of the following statements are true, EXCEPT:

- A) Sample size is necessary to achieve statistical significance.
- B) Sample size is essential to achieve medical significance.
- C) A statistically significant result may and may not be medically significant.
- D) Larger the sample size, more is the chance of getting statistical significance.

40) All the following are Random Sampling Methods EXCEPT:

- A) Simple Random Sampling
- B) Stratified Sampling
- C) Cluster Sampling
- D) Quota Sampling

41) The square of the correlation coefficient, the value represents:

- A) The strength of the non-linear relationship between two variables
- B) The risk ratio between two variables
- C) Odds ratio
- D) The proportion of variation in the dependent variable that can be explained by the independent variable

42) The major advantage of a probability sample compared to a non-probability sample is that:

- A) It saves time
- B) It costs less
- C) It enables to compute average value
- D) Sampling error can be estimated.

43) Incidence is defined as:

- A) Number of new cases occurring during a specified period in given population
- B) Number of old cases present during a specified period in given population
- C) Number of cases occurring in a given population
- D) Number of cases existing in a given population at a given time

44) The difference between sample estimate and population parameter is known as:

- A) Standard error
- B) Sampling error
- C) Absolute error
- D) Sampling variance

45) Log-rank test is a hypothesis test for comparing the survival distributions of two or more groups, used in?

- A) Life table
- B) Cox regression model
- C) Kaplan Meier method
- D) All of the above

46) Which method is used to calculate the probability of survival for each of equal interval time ?

- A) Life table
- B) Kaplan Meier Method
- C) Cox regression
- D) Linear regression

47) Which of the following technique is used for exploring the relationship between the survival time of patients and covariates?

- A) Life table
- B) Cox regression model
- C) Kaplan Meier method
- D) All of the above

48) Hazard ratio is calculated in

- A) Life table
- B) Cox regression model

- C) Kaplan Meier method
- D) All of the above

49) The receiver operating characteristic (ROC) curve is plotted between

- A) Sensitivity & False negative rate
- B) Sensitivity & False positive rate
- C) Sensitivity & Specificity
- D) Specificity & False positive rate

50) Which of the following measure should be used to test the ability of a diagnostic test to correctly classify an individual as 'Negative' when he has no disease?

- A) Sensitivity
- B) Specificity
- C) False positive rate
- D) False negative rate

RIMS, PhD ENTRANCE EXAM [Session-2024]**Part-B: NURSING**

-
- 51) Which mechanism enables the cardiac muscle to relax during diastole?
- A) Release of calcium ions from myofibrillar proteins.
 - B) Increased operation of L-type calcium channels.
 - C) ATP-dependent activity in contractile cross-bridge units.
 - D) Mechanical pivoting motion in myosin head regions.
- 52) What ensures the unidirectional flow of blood through the heart?
- A) The one-way opening of valves when upstream pressure exceeds downstream.
 - B) The cardiac cycle is regulated by the autonomic nervous system control.
 - C) The joint operation of atrial and ventricular muscles coordinating flow.
 - D) The support by chordae tendinae provides stabilization to the heart valves.
- 53) What primarily drives the balance of fluid movement at the capillary wall?
- A) The vessel wall's selective permeability to serum proteins and molecules.
 - B) The sodium levels present along the endothelial boundary of capillaries.
 - C) The gradients of electrolytes that exist outside and inside the lumen.
 - D) The oncotic and hydrostatic pressures acting across the capillary layers.
- 54) What laboratory abnormality should raise suspicion for hemolytic anemia in critically ill patients?
- A) Heightened reticulocytes suggest active red cell production increase.
 - B) Reduced leukocytes signify unusual immune or marrow dysfunction.
 - C) Elevated levels of LDH indicate potential red blood cell breakdown.
 - D) Permanent hematocrit consistency does not align with hemolysis.
- 55) Which condition can cause eosinophilic leukocytosis?
- A) High exposure to sources of ionizing radiations
 - B) Excessive blood pooling due to hypersplenism cases
 - C) Frequent insertion of venous catheterized devices
 - D) Parasite infestations such as helminthic infections
- 56) Which subset of antibiotics acts by inhibiting the synthesis of bacterial cell walls?
- A) Aminoglycosides like gentamicin and amikacin
 - B) Beta-lactam antibiotics like penicillins and carbapenems
 - C) Quinolones trained for use in respiratory therapy
 - D) Macrolides such as erythromycin or azithromycin
- 57) Which type of infections do macrolides primarily target?
- A) Respiratory tract infections and atypical bacterial pathogens
 - B) Bloodstream infections with resistant bacterial strains
 - C) Anaerobic infections such as abscesses or gangrene
 - D) Gram-negative sepsis occurring by intestinal bacteria
- 58) Which anti-fungal class inhibits glucan synthesis in the fungal cell wall?
- A) Azoles inhibiting pathways related to ergosterol alone
 - B) Polyenes interacting directly with ergosterol membranes
 - C) Allylamines interrupt fungal cell membrane sterols
 - D) Echinocandins stopping glucan production in fungal walls
- 59) Which antibiotic is primarily recommended for treating ESBL-producing bacterial organisms?

- A) Cephalosporins
 - B) Tetracyclines
 - C) Carbapenems
 - D) Macrolides
- 60) How long will a full E-cylinder of oxygen, when the tank pressure measures 2200 psig and the flow rate is 4 L/min, last approximately?
- A) Its total operating time is roughly two hundred ten minutes.
 - B) The oxygen will deplete in approximately ninety-eight total minutes.
 - C) It provides oxygen for about two hundred and eighty-five minutes.
 - D) The cylinder will last for about one hundred fifty-four minutes
- 61) Why should an oropharyngeal airway not be taped into place?
- A) Provides quick access for timely medical interventions.
 - B) Maintaining flexibility enhances the patient's comfort.
 - C) Taping prevents easy removal during consciousness regaining.
 - D) It lessens the chances of insertion region infection.
- 62) What is the purpose of the water level fluctuating in the water-seal bottle of a chest tube drainage system?
- A) To monitor pressure within the connected suction system.
 - B) To secure the fluid's containment against backflow.
 - C) To show changes in pleural pressure during respiration.
 - D) To maintain the tube's functional patency and safety.
- 63) What is a potential hazard of performing a Valsalva maneuver during incentive spirometry?
- A) Occasional occurrence of body temperature elevation observed.
 - B) Activation of reflex causing bradycardia via vagus nerve effects.
 - C) Obstruction of significant airflow directed towards one lung lobe.
 - D) Potential risk of airway bronchospasms occurring in the lungs.
- 64) What is the maximum recommended increase in sodium levels within the first 24 hours of treatment for hyponatremia?
- A) Sodium level increased a total of 18 mEq each day
 - B) Sodium concentration elevated up to 6 mEq in 24 h
 - C) Sodium risen no more than 24 mEq over the day
 - D) Sodium level raised at most 12 mEq per day
- 65) Which insulin administration carries a higher risk of hypoglycemia in diabetes management?
- A) Short half-life, short-acting insulins used before meals.
 - B) Intermediate-acting insulins combined with meal planning treatments.
 - C) Long-acting basal insulins administered once daily for glucose control.
 - D) Insulins utilized with continuous monitoring devices for adjustments.
- 66) What is the preferred treatment for unconscious hypoglycemic diabetic patients in environments without parenteral access?
- A) Subcutaneous injections of insulin for managing blood sugar levels.
 - B) Intravenous administration of glucose infusion for effective glucose correcting.
 - C) Rectal application of a 30 ml honey solution in 500 ml water.
 - D) Parenteral injections of glucagon for raising blood glucose quickly.
- 67) What are the most common living donor liver transplantation types for adult recipients?
- A) The whole liver but not partial transplantation
 - B) The right lobe and also later the left lobe
 - C) The caudate lobe uniquely for donors' contributions
 - D) A split-liver but not fully removed operation
- 68) What anatomical feature of the liver separates its two main lobes anteriorly?
- A) The anterior boundary is defined by the falciform ligament.
 - B) This role is played by the coronary ligament on the liver.
 - C) The ligamentum venosum serves this dividing function anteriorly.
 - D) Anteriorly, the separation is marked by the hepatic artery.
- 69) Which biopsy method involves passing a catheter through the internal jugular vein to the liver?

- A) Minimally invasive laparoscopic biopsy method
- B) Transvenous jugular liver biopsy sampling
- C) Percutaneous needle liver biopsy process
- D) Endoscopic ultrasound-guided tissue biopsy

70) What defines the mean pulmonary arterial pressure in the diagnosis of pulmonary hypertension?

- A) Baseline pressure of 15 mmHg seen under cardiac output stress
- B) Pulmonary arterial tension measured at rest exceeding 25 mmHg
- C) Pressure exceeding systemic arterial parameters consistently
- D) Elevated pressure levels observed while exercising moderately

71) What is the typical clinical manifestation in patients with Wilson's disease involving the cornea?

- A) The presence of Kayser-Fleischer rings in the eyes
- B) Proptosis affecting the eyeball's position
- C) Formation of cataracts impairing clear sight
- D) Blurred vision leading to focusing difficulty

72) Which artery primarily supplies blood to the thalamus?

- A) The middle cerebral artery supports cortical outer areas
- B) The medial and lateral lenticulostriate arterial network
- C) The anterior cerebral artery supplies frontal brain regions
- D) The posterior communicating artery connects circle vessels

73) What is Broca's area responsible for?

- A) Motor coordination responsible for voluntary movement control
- B) Receptive speech functions centered on auditory processing
- C) Sensory processing unit interpreting tactile environmental input
- D) Expressive speech production used for verbal communication

74) What is the main function of the reticular activating system?

- A) It manages temperature while optimizing blood flow
- B) It induces sensory alerts while reducing perception
- C) It provides coordination while aiding proprioception
- D) It maintains wakefulness while enhancing arousal

75) What physiological effect results from the loss of cerebral autoregulation post-cerebral injury?

- A) The cerebrovascular resistance markedly reduces, increasing blood flow.
- B) Peripheral vascular resistance increases significantly over time.
- C) Perfusion of cerebral tissues becomes linearly dependent on systemic blood pressure changes.
- D) Cerebral blood flow remains constant despite pressure changes.

76) Which complication rate is highest for ventriculostomy catheters?

- A) The CSF drainage procedure is prevalent overall.
- B) Accuracy drift happens with extended usage.
- C) The occurrence of infections is notably higher.
- D) Hemorrhages are less frequent as complications.

77) What does the presence of rounded ICP waveforms suggest?

- A) Arterial blood delivery has been significantly raised.
- B) The brain may be on the verge of herniation.
- C) Intracranial pressure seems to remain stable.
- D) Compliance within the cranium has diminished.

78) What device is used to determine cerebral blood flow velocities in major cerebral arteries?

- A) EEG (Electroencephalogram), examining brain electric activities.
- B) The Transcranial Doppler (TCD), utilizing ultrasonic-based assessments.
- C) Intracranial pressure monitor, employed to analyze pressure changes.
- D) Jugular venous oximeter, monitoring oxygen uptake parameters.

79) What primarily causes Subarachnoid Hemorrhage (SAH) in most cases?

- A) Diffuse axonal injury, related to head injury events.
 - B) Physiological tensions affecting the defensive brain systems.
 - C) Cerebral hypoxia circumstances impairing the oxygen delivery.
 - D) Aneurysmal ruptures within the brain's arterial structures.
- 80) What does a Pressure Reactivity Index (PRx) signify in neurocritical care?
- A) The episodic index concerning hyperreactivity of the active tissues.
 - B) The oxygenation status of brain neurons and cellular components.
 - C) The representable consistency in metabolic marker observations.
 - D) The responsiveness to arterial pressure and the brain perfusion.
- 81) How is catheter-related bloodstream infection (CRBSI) characterized?
- A) Symptoms are limited to fever and no bloodstream infection occurs.
 - B) It exclusively involves infections unrelated to central line usage.
 - C) Presence of systemic bacteremia or fungemia alongside catheter usage.
 - D) It strictly involves fungal infections disregarding other microbial agents.
- 82) Which condition may arise from paranasal sinusitis?
- A) Selective glandular abscess incidences are strongly promoted therein.
 - B) Localized urethritic issues purely arise without external consequences.
 - C) Nearby sinusitis commonly instigates cavernous venous thrombosis conditions.
 - D) Thy related cardiac conditions such endocarditis frequently arise.
- 83) What are the main categories for infectious causes of keratitis?
- A) The categories are bacterial, fungal, parasitic, and viral pathogens.
 - B) Inflammatory, degenerative, and other disease categories cited.
 - C) Viruses, bacteria, fungus, and parasites in infectious cases.
 - D) Primary categories include trauma and non-infection-related.
- 84) What syndrome can Influenza viral infection exacerbate alongside bacterial pneumonia?
- A) Persistent pleural effusions contributing to fluid accumulations.
 - B) Chronic bronchitis symptoms with pulmonary airway obstruction.
 - C) Minimal pulmonary changes presenting symptom-free progression.
 - D) Acute respiratory distress from inflammatory syndromic effects.
- 85) Which pathogen grouping is referred to using the acronym ESKAPE?
- A) Rickettsia, Streptococcus pyogenes, Koliform species, Fungus variants, Parasite amoebas, Unique infections.
 - B) Escherichia species, Staphylococcus, Klebsiella pneumonia, Aspergillus fumigatus, Pneumocystis jirovecii, Moraxella.
 - C) Serovars list, ProtoNames, BacteriaClasses, VirusClusters, ResistantGroupings, LaboratoryCultures.
 - D) Enterococcus, Staphylococcus aureus, Klebsiella pneumoniae, Acinetobacter, Pseudomonas aeruginosa, Enterobacter.
- 86) What is a differential diagnosis consideration for acute liver failure associated with vascular conditions?
- A) Wilson's disease with copper accumulation effects.
 - B) Chronic giardiasis causing malabsorption issues.
 - C) Tyrosinemia leading to metabolic disruptions.
 - D) Budd-Chiari syndrome affecting vascular flow.
- 87) Which measure is illegal in India concerning terminally ill patients, according to stated guidelines?
- A) Refusing insufficient care with ethical authorization present.
 - B) Activating multi-administrative coordination for fair consensus.
 - C) Practicing direct euthanasia involving intentional life termination.
 - D) Implementing extended facilities towards palliative expansions.
- 88) What legal provision validates a living will?
- A) Registration within a database ensuring recognition at healthcare facilities
 - B) Signing witnessed by immediate family ensuring authenticity of stated intentions
 - C) Alignment with state-specific requirements for enforceable healthcare documents
 - D) A detailed inclusion of listed treatments for affirmation of medical preferences
- 89) Under what circumstances can an advance directive be used to guide healthcare decisions?

- A) Before proposing a treatment plan, to align expectations with the patient
 - B) When the physician doesn't discuss options due to an urgent timeline
 - C) If the patient is incapacitated and requires third-party decision assistance
 - D) When family members are in disagreement about treatment preferences
- 90) Which challenges are associated with the practice of keeping the abdomen open after damage control laparotomy?
- A) Bowel edema and ileus disrupt successful patient closure
 - B) Potential trouble monitoring pressure levels in maintained care
 - C) Heightened risk of skeletal muscle degeneration indicators
 - D) Increased risk of immediate infection and patient issues
- 91) Why is the diagnosis of acute appendicitis more challenging in pregnant patients?
- A) Pregnancy is associated with heightened immune system response.
 - B) Observed laboratory findings are indicative of appendicitis.
 - C) Pregnancy mitigates most symptoms of appendicitis occurrence.
 - D) The uterus's upward displacement alters pain and tenderness locations.
- 92) How can aspiration pneumonia be prevented during early bronchoscopy?
- A) Providing no sedative agents for safety during the bronchoscopy.
 - B) Ensuring patient remains upright throughout the procedure.
 - C) By applying lidocaine to limit reflex and patient discomfort.
 - D) Administering broad-spectrum antibiotics immediately as a measure.
- 93) What condition can increase the likelihood of pneumothorax during bronchoscopic biopsy?
- A) Topical lidocaine application before performing procedures safely.
 - B) Introduction of atropine to minimize secretion and improve visuals.
 - C) Mechanical ventilation leading to uneven lung pressure dynamics.
 - D) Minimal sedation ensuring awareness during hectic diagnoses
- 94) What is the recommended volume of blood per culture tube for effective bacteremia detection?
- A) A suggested volume of fifteen ml per tube
 - B) An endorsed volume of twenty ml per tube
 - C) A recommended volume of ten ml per tube
 - D) A preferred volume of eight ml per tube
- 95) What advantage does the vacuum-assisted closure (VAC) device provide?
- A) Alleviate abdominal edema aiding fascial closure later
 - B) Enhance vascular blood flow inside abdominal cavity areas
 - C) Facilitates immediate surgical site repair without delays
 - D) Directly aids in reducing infection frequency effectively
- 96) Which of the following is NOT a method for managing clinically significant bleeding due to warfarin therapy with elevated INR?
- A) Administration of vitamin K
 - B) Discontinuation of warfarin therapy
 - C) Administration of recombinant factor VIIa
 - D) Administration of fresh frozen plasma
- 97) What is the primary mechanism of action for aspirin as an antiplatelet agent?
- A) Irreversible inhibition of cyclooxygenase enzymes
 - B) Inhibition of adenosine diphosphate receptors
 - C) Blocking of glycoprotein IIb/IIIa receptors
 - D) Antagonism of thrombin receptors
- 98) For asthma patients, what is typically used in addition to beta-2 agonists to enhance their efficacy?
- A) Adding inhaled ipratropium bromide, improving outcomes.
 - B) Vitamin supplementation aimed at health improvement.
 - C) Broad-spectrum antibiotics for respiratory infections.
 - D) Oral antihistamines intended for allergy management.
- 99) Which measurement typically indicates tissue hypoxia due to impaired oxygen extraction in severe sepsis?

- A) Reduced proportion of oxygen saturation in arterial blood
- B) A rise in venous oxygen levels in central sites
- C) A decrease in oxygen carrying capacity deleterious to hemoglobin
- D) An increase in plasma creatinine levels, a renal biomarker

100) What condition can cause a shortened QT interval observed on an ECG?

- A) Lowered body core temperature indicative as hypothermia cases
- B) Elevated calcium level known clinically as hypercalcemia syndrome
- C) Depleted potassium ions resulting from severe hypokalemic states
- D) Reduced iron in bloodstream shown during severe anemic phases

PhD ENTRANCE EXAM [Session-2024]**Rajendra Institute of Medical Sciences, Ranchi**

Roll No:

Answer Sheet Number:

Full Name:

Mobile Number and Email ID:

Signature of Candidate:

Signature of Invigilator:

Number of Questions: Part A - 50 & Part B-50

Time: 2 hours | Maximum Marks: 100

Number of pages in this Booklet: 13**Please Read these instructions carefully:**

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BOOKLET NUMBER	SUBJECT NAME DENTAL	SUBJECT CODE 02
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- A) Manuscript
 - B) Protocol
 - C) Commentary
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- 10) Which of the following is an example of artificial intelligence?
- A) Manufacturing robots.
 - B) Virtual travel booking agent.
 - C) Self-driving cars.
 - D) All of the above
- 11) A researcher wishes to estimate the incidence of Myocardial infarction cases among a group of women using Oral Contraceptive Pills (OCP) who have been followed up for 10 years. Which of the following study designs is best suitable for this?
- A) Case series
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- 12) Which of the following study designs can be used to determine the factors associated with a health-related outcome?
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 - B) Analytical cross-sectional study
 - C) Case study
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- 13) If your objective is to estimate the prevalence of a health problem in a community in 2021, which of the following would most likely be the type of research question?
- A) Analytical research question
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- 14) Complete the statement. A study design that randomly assigns participants into an experimental group or a control group is known as
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- 15) The mean of a distribution is 14 and the standard deviation is 5. What is the value of the coefficient of variation?
- A) 60.40%
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 - C) 35.70%
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 - B) Measure of Central Tendency
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 - D) Measure of Shape
- 18) According to the empirical rule, approximately what percent of the data should lie within ± 2 SD
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 - B) 68.20%

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- D) 95.40%

19) Which of the following is a measure of central tendency?

- A) Percentile
- B) Quartile
- C) Standard deviation
- D) Mode

20) Which of the following divides a group of data into four subgroups?

- A) Percentiles
- B) Deciles
- C) Median
- D) Quartiles

21) If the standard deviation of a population is 9, the population variance is:

- A) 9
- B) 3
- C) 21
- D) 81

22) The sum of the deviations about the mean is always:

- A) Zero
- B) Total Standard Deviation
- C) Positive
- D) Negative

23) What is the appropriate measure of dispersion if mean is reported as the measure of central tendency for a given set of data?

- A) Standard deviation
- B) Interquartile range
- C) Variance
- D) Coefficient of variation

24) Parameter is a measure which is computed from

- A) Population data
- B) Sample data
- C) Test statistics
- D) None of these

25) The height of a student is 60 inches. This is an example of -

- A) Qualitative data
- B) Categorical data
- C) Continuous data
- D) Discrete data

26) Which of the following is not included in the background section of a concept paper.

- A) Importance of a health problem
- B) Known facts about the health problem
- C) Prior contribution of the researcher in the topic
- D) Knowledge gap in the topic

27) Which of the following sections of a protocol includes the details regarding data quality assurance?

- A) Data collection
- B) Data analysis
- C) Project implementation
- D) Data entry

28) Which of the following method is not a method of Decision Tree ?

- A) Classification and Regression Trees (CART)
- B) Chi-square automatic interaction detection (CHAID)

- C) Analysis of variance Trees
D) Quick, Unbiased, Efficient Statistical Trees
- 29) Which of the following helps to minimize random error in a research study?
- A) Limited study duration
B) Adequate sample size
C) Adequate budget
D) More number of investigators
- 30) Best way to study relationship between two continuous variables is:
- A) Bar Chart
B) Histogram
C) Pie Chart
D) Scatter Diagram
- 31) When frequency of a variable is given in form of mild, moderate and severe, the data scale used is:
- A) Nominal
B) Ordinal
C) Interval
D) Ratio
- 32) Which of the following is not a continuous variable?
- A) Height
B) Weight
C) Temperature
D) Parity
- 33) If Arithmetic Mean=25 and Geometric Mean=15 then Harmonic Mean is:
- A) 25
B) 5
C) 9
D) 15
- 34) Which of the following is a nominal variable?
- A) Blood sugar level
B) Blood type (A, B, AB, O)
C) Severity of Pain (Mild, Moderate, Severe)
D) Hemoglobin level
- 35) Population census is conducted through
- A) Sample survey
B) Accounting
C) Investigation
D) Complete enumeration
- 36) The value of coefficient of correlation lies between
- A) 0 to -1
B) 0 to 1
C) 1 to -10
D) -1 to 1
- 37) Which of the following is a True statement?
- A) Coefficient of variation = $(S.E. / \text{Mean}) \times 100$
B) Interquartile Range is difference of minimum and maximum value of a data set
C) Standard deviation = Square of variance
D) Standard deviation is always \geq Std error
- 38) As sample size increases, standard deviation of sample means:
- A) Decreases
B) Increases

- C) Remains the same
- D) Approaches to infinity

39) All of the following statements are true, EXCEPT:

- A) Sample size is necessary to achieve statistical significance.
- B) Sample size is essential to achieve medical significance.
- C) A statistically significant result may and may not be medically significant.
- D) Larger the sample size, more is the chance of getting statistical significance.

40) All the following are Random Sampling Methods EXCEPT:

- A) Simple Random Sampling
- B) Stratified Sampling
- C) Cluster Sampling
- D) Quota Sampling

41) The square of the correlation coefficient, the value represents:

- A) The strength of the non-linear relationship between two variables
- B) The risk ratio between two variables
- C) Odds ratio
- D) The proportion of variation in the dependent variable that can be explained by the independent variable

42) The major advantage of a probability sample compared to a non-probability sample is that:

- A) It saves time
- B) It costs less
- C) It enables to compute average value
- D) Sampling error can be estimated.

43) Incidence is defined as:

- A) Number of new cases occurring during a specified period in given population
- B) Number of old cases present during a specified period in given population
- C) Number of cases occurring in a given population
- D) Number of cases existing in a given population at a given time

44) The difference between sample estimate and population parameter is known as:

- A) Standard error
- B) Sampling error
- C) Absolute error
- D) Sampling variance

45) Log-rank test is a hypothesis test for comparing the survival distributions of two or more groups, used in?

- A) Life table
- B) Cox regression model
- C) Kaplan Meier method
- D) All of the above

46) Which method is used to calculate the probability of survival for each of equal interval time ?

- A) Life table
- B) Kaplan Meier Method
- C) Cox regression
- D) Linear regression

47) Which of the following technique is used for exploring the relationship between the survival time of patients and covariates?

- A) Life table
- B) Cox regression model
- C) Kaplan Meier method
- D) All of the above

48) Hazard ratio is calculated in

- A) Life table
- B) Cox regression model

- C) Kaplan Meier method
- D) All of the above

49) The receiver operating characteristic (ROC) curve is plotted between

- A) Sensitivity & False negative rate
- B) Sensitivity & False positive rate
- C) Sensitivity & Specificity
- D) Specificity & False positive rate

50) Which of the following measure should be used to test the ability of a diagnostic test to correctly classify an individual as 'Negative' when he has no disease?

- A) Sensitivity
- B) Specificity
- C) False positive rate
- D) False negative rate

RIMS, PhD ENTRANCE EXAM [Session-2024]**Part-B: DENTISTRY**

-
- 51) What is functional occlusion?
- A) The contact of teeth during rest
 - B) The contact of teeth during chewing or swallowing
 - C) The color change in teeth due to wear
 - D) The alignment of teeth after orthodontic treatment
- 52) What is centric relation?
- A) The color of central incisors
 - B) The most anterior position of the mandible
 - C) The most posterior position of the mandible
 - D) The vertical dimension of occlusion
- 53) Occlusal guards are NOT typically used for:
- A) Preventing tooth wear from bruxism
 - B) Treating sleep apnea
 - C) Managing TMJ disorders
 - D) Aligning teeth
- 54) What is the Curve of Spee?
- A) The curvature of the occlusal plane
 - B) A measurement of overjet
 - C) The color gradient of teeth
 - D) The alignment of incisors
- 55) When is a pulpectomy indicated in primary teeth?
- A) For every carious lesion
 - B) For primary teeth with necrotic pulps or irreversible pulpitis
 - C) To enhance tooth color
 - D) To reduce treatment cost
- 56) What is the role of EDTA in managing calcified canals?
- A) To enhance tooth color
 - B) To chelate and soften calcified tissue, facilitating file penetration
 - C) To reduce treatment cost
 - D) To avoid further procedures
- 57) What is the success rate of non-surgical root canal therapy?
- A) 30-40%
 - B) 50-60%
 - C) 70-90%
 - D) 90-100%
- 58) When should pulpal vitality testing be conducted after a traumatic injury?
- A) Immediately after injury
 - B) One week after injury
 - C) 2-4 weeks after injury and periodically thereafter
 - D) Never
- 59) What is the treatment approach for a tooth with intrusive luxation?

- A) Immediate extraction
 - B) Allowing the tooth to reposition itself
 - C) Surgical repositioning and stabilization
 - D) Applying fluoride varnish
- 60) Which nutrient deficiency is most closely associated with periodontal disease?
- A) Vitamin C
 - B) Iron
 - C) Vitamin D
 - D) Calcium
- 61) What is the role of systemic antimicrobials in periodontal therapy?
- A) They are used as a monotherapy for all periodontal diseases
 - B) They are primarily used for cosmetic purposes
 - C) They can be adjunctive to mechanical therapy in specific cases of periodontal disease
 - D) They replace the need for oral hygiene practices
- 62) Which medication is most commonly associated with drug-induced gingival hyperplasia?
- A) Ibuprofen
 - B) Aspirin
 - C) Nifedipine
 - D) Paracetamol
- 63) What is the principle behind photodynamic therapy in periodontal treatment?
- A) To mechanically remove plaque and calculus
 - B) To use light-activated agents to target and reduce periodontal pathogens
 - C) To improve the aesthetics of the gingiva
 - D) To replace traditional scaling and root planning
- 64) Which index is used to assess the prevalence and severity of periodontal disease in populations?
- A) The Plaque Index
 - B) The Gingival Index
 - C) The Periodontal Screening and Recording (PSR) Index
 - D) The Community Periodontal Index (CPI)
- 65) What is the role of matrix metalloproteinases (MMPs) in periodontal disease?
- A) They primarily function to rebuild periodontal tissue
 - B) They are involved in tissue remodeling and can contribute to the breakdown of connective tissue in periodontal disease
 - C) They have no role in periodontal disease
 - D) They enhance the immune response against periodontal pathogens
- 66) What is the purpose of the retention phase in orthodontics?
- A) To accelerate tooth movement
 - B) To stabilize teeth in their new positions
 - C) To initiate tooth movement
 - D) To increase tooth size
- 67) Which appliance is commonly used for molar distalization in orthodontics?
- A) Headgear
 - B) Hawley retainer
 - C) Lingual arch
 - D) Palatal expander
- 68) What is the purpose of using mini-implants in orthodontics?
- A) To provide temporary skeletal anchorage
 - B) To replace missing teeth
 - C) To hold removable appliances
 - D) To change tooth color
- 69) What is the primary purpose of the Herbst appliance in orthodontics?

- A) To correct posterior crossbite
 - B) To correct Class II malocclusions by promoting mandibular growth
 - C) To stabilize the maxillary arch
 - D) To align anterior teeth
- 70) What is a common strategy to prevent orthodontic relapse?
- A) Increasing force application during treatment
 - B) Regular retainer wear as prescribed
 - C) No special strategy is needed
 - D) Using more rigid archwires
- 71) What is the primary purpose of using a dental liner under a restoration?
- A) To improve aesthetic appearance
 - B) To provide mechanical support
 - C) To protect the pulp from thermal shock
 - D) To bond the restoration to the tooth
- 72) Which tool is essential for the diagnosis of dental caries in operative dentistry?
- A) Dental explorer
 - B) Orthopantomogram (OPG)
 - C) Dental scaler
 - D) Electric pulp tester
- 73) What is the purpose of acid etching in adhesive dentistry?
- A) To sterilize the tooth surface
 - B) To create micro-retentive surfaces for better bonding
 - C) To bleach the tooth
 - D) To reduce sensitivity
- 74) What is the role of eugenol in zinc oxide eugenol cement, and what are its implications?
- A) Eugenol acts as a plasticizer and has a sedative effect on pulp, but it can interfere with the setting of resin materials
 - B) Eugenol is mainly used to enhance the color of the cement
 - C) It speeds up the setting reaction
 - D) Eugenol increases the cement's strength
- 75) Which type of dental composite has the lowest polymerization shrinkage?
- A) Bulk-fill composites
 - B) Flowable composites
 - C) Microfilled composites
 - D) Nanohybrid composites
- 76) What special consideration is required for oral surgery in patients with hemophilia?
- A) No special consideration needed
 - B) Preoperative and postoperative management with clotting factor replacement
 - C) Avoid all dental extractions
 - D) Only perform minor oral surgery
- 77) What is the common treatment for a non-displaced zygomatic fracture?
- A) Observation and soft diet
 - B) Rigid fixation with plates and screws
 - C) Extraction of adjacent teeth
 - D) Tooth whitening
- 78) What is the first step in managing an infected dental implant?
- A) Immediate removal of the implant
 - B) Conservative debridement and antibiotic therapy
 - C) Tooth whitening
 - D) Ignore the infection
- 79) Which forceps are typically used for extracting maxillary third molars?

- A) No. 150 forceps
 - B) No. 88L and 88R forceps
 - C) No. 151 forceps
 - D) No. 74 forceps
- 80) What is the most appropriate initial treatment for acute osteomyelitis of the jaw?
- A) Immediate surgical debridement
 - B) High-dose intravenous antibiotics
 - C) Extraction of all teeth in the affected area
 - D) Application of fluoride varnish
- 81) Which pathogen is most commonly associated with osteomyelitis of the jaw?
- A) Streptococcus
 - B) Staphylococcus aureus
 - C) Candida albicans
 - D) Escherichia coli
- 82) Which systemic condition can be associated with giant cell lesions of the jaw?
- A) Asthma
 - B) Diabetes
 - C) Hypertension
 - D) Hyperparathyroidism
- 83) Which histopathological feature is characteristic of ameloblastoma?
- A) Necrotic bone
 - B) Multinucleated giant cells
 - C) Islands of odontogenic epithelium
 - D) Pseudocysts
- 84) What is a characteristic feature of odontogenic keratocyst?
- A) Multilocular radiolucency
 - B) Radiopaque lesions
 - C) Ground glass appearance
 - D) Parakeratinized epithelial lining
- 85) What is the initial management approach for Paget's disease of the jaw?
- A) Radiation therapy
 - B) Observation and monitoring
 - C) Chemotherapy
 - D) Bisphosphonate therapy
- 86) Which strain of HPV is most commonly associated with oral cancer?
- A) HPV 6
 - B) HPV 11
 - C) HPV 16
 - D) HPV 18
- 87) Which chemotherapeutic agent is commonly used in the treatment of oral cancer?
- A) Methotrexate
 - B) Cisplatin
 - C) Doxorubicin
 - D) Paclitaxel
- 88) Which is the most common benign oral lesion?
- A) Fibroma
 - B) Pyogenic granuloma
 - C) Mucocele
 - D) Ameloblastoma
- 89) What is the gold standard for diagnosing herpetic lesions?

- A) PCR testing
 - B) Culture of vesicular fluid
 - C) Blood test
 - D) Clinical examination
- 90) Which histopathological feature is indicative of oral lichen planus?
- A) Hyperkeratosis with saw-tooth rete ridges
 - B) Granulomatous inflammation
 - C) Acantholysis
 - D) Giant cell formation
- 91) What do the striae of Retzius in enamel represent?
- A) Daily incremental lines
 - B) Weekly incremental lines
 - C) Lines of mineral deposition
 - D) Lines of mineral resorption
- 92) What is interglobular dentin?
- A) Areas of unmineralized dentin
 - B) Areas of hypermineralized dentin
 - C) Areas with no tubules
 - D) Areas with increased collagen content
- 93) Where is cementum typically the thickest?
- A) At the cementoenamel junction
 - B) In the middle third of the root
 - C) At the root apex
 - D) At the crown
- 94) Which zone of the pulp is immediately adjacent to the dentin?
- A) Pulp core
 - B) Cell-rich zone
 - C) Odontoblastic layer
 - D) Cell-free zone
- 95) What is reciprocal induction in odontogenesis?
- A) The mutual signaling between epithelial and mesenchymal cells to promote differentiation
 - B) The interaction between odontoblasts and ameloblasts to form dentin
 - C) The signaling between enamel knot and dental papilla
 - D) The communication between dental sac and dental lamina
- 96) What is the approximate cell turnover rate of the junctional epithelium?
- A) 10-14 days
 - B) 1-3 days
 - C) 7-10 days
 - D) 14-21 days
- 97) Which factor is crucial for bone resorption in periodontal disease?
- A) Calcitonin
 - B) Osteoprotegerin
 - C) RANKL (Receptor Activator of Nuclear Factor κ B Ligand)
 - D) Osteocalcin
- 98) What is the role of matrix metalloproteinases in periodontal disease?
- A) Inhibiting bacterial growth
 - B) Degrading extracellular matrix components
 - C) Enhancing tissue repair
 - D) Promoting collagen synthesis
- 99) What type of cartilage is found in the temporomandibular joint (TMJ)?

- A) Hyaline cartilage
- B) Elastic cartilage
- C) Fibrocartilage
- D) Articular cartilage

100) Which type of glands are more abundant in the soft palate compared to the hard palate?

- A) Serous glands
- B) Mucous glands
- C) Sebaceous glands
- D) Meibomian glands

Answer Key:-

Part - A Research Methodology				Part - B Dentistry			
S. No.	Key	S. No.	Key	S. No.	Key	S. No.	Key
1	A	26	C	51	B	76	B
2	A	27	C	52	C	77	A
3	C	28	C	53	D	78	B
4	C	29	B	54	A	79	B
5	D	30	D	55	B	80	B
6	B	31	B	56	B	81	B
7	D	32	D	57	C	82	D
8	D	33	C	58	C	83	C
9	B	34	B	59	C	84	D
10	D	35	D	60	A	85	D
11	B	36	D	61	C	86	C
12	B	37	D	62	C	87	B
13	B	38	A	63	B	88	A
14	C	39	B	64	D	89	B
15	C	40	D	65	B	90	A
16	B	41	D	66	B	91	B
17	B	42	D	67	A	92	A
18	D	43	A	68	A	93	C
19	D	44	B	69	B	94	C
20	D	45	C	70	B	95	A
21	D	46	A	71	C	96	B
22	A	47	B	72	A	97	C
23	A	48	B	73	B	98	B
24	A	49	B	74	A	99	C
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Dean (Research)
Rajendra Institute of
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9	B	34	B	59	A	84	A
10	D	35	D	60	C	85	B
11	B	36	D	61	C	86	C
12	B	37	D	62	D	87	C
13	B	38	A	63	C	88	A
14	C	39	B	64	D	89	D
15	C	40	D	65	A	90	B
16	B	41	D	66	A	91	B
17	B	42	D	67	C	92	A
18	D	43	A	68	B	93	B
19	D	44	B	69	C	94	C
20	D	45	C	70	C	95	C
21	D	46	A	71	D	96	C
22	A	47	B	72	C	97	A
23	A	48	B	73	D	98	D
24	A	49	B	74	D	99	A
25	C	50	B	75	A	100	A

PhD ENTRANCE EXAM [Session-2024]
Rajendra Institute of Medical Sciences, Ranchi

Roll No:

Answer Sheet Number:

Full Name:

Mobile Number and Email ID:

Signature of Candidate:

Signature of Invigilator:

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BOOKLET NUMBER	SUBJECT NAME	SUBJECT CODE
	PARAMEDICAL	03

RIMS, PhD ENTRANCE EXAM [Session-2024]**Part-A: RESEARCH METHODOLOGY**

1) To test the association of diabetes on kidney disease, 100 kidney disease patients and 100 healthy (no kidney disease) persons were recruited. There were 30% and 10% diabetic persons in disease and healthy group's, study design is:

- A) Case control study
- B) Cross sectional study
- C) Cohort study
- D) Randomized controlled trials

2) What is the best design to study the prevalence of a disease?

- A) Cross-sectional study
- B) Case-control study
- C) Cohort study
- D) Randomized controlled trials

3) Which type of study is loosely structured and designed to expand understanding of a topic and provide insights

- A) Formal
- B) Causal
- C) Exploratory
- D) Descriptive

4) All of the following are possible goals of an exploratory study EXCEPT.....

- A) Discover future research tasks
- B) Expand understanding of a topic
- C) Test hypotheses
- D) Provide insight

5) All of the following are true for Case study EXCEPT..

- A) Usually on rare disease /condition
- B) Descriptive study
- C) Observational study
- D) Statistical significance

6) Which of the following sections of a protocol includes the description of study population, sample size and sampling

- A) Introduction
- B) Methods
- C) Objectives
- D) Expected Benefits

7) The research is always –

- A) Verifying the old knowledge
- B) Exploring new knowledge
- C) Filling the gap between knowledge
- D) All of these

8) Which of the following is NOT a characteristic of a well-designed Randomized Controlled Trials (RCT)?

- A) Random assignment of participants to treatment and control groups
- B) Blinding of participants and researchers for treatment allocation
- C) Use of a pre-determined sample size
- D) Inclusion of participants using snowball sampling

9) Complete the statement. A written plan detailing the proposed implementation of a research study is known as

- A) Manuscript
- B) Protocol
- C) Commentary
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10) Which of the following is an example of artificial intelligence?

- A) Manufacturing robots.
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- C) Sensitivity & Specificity
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50) Which of the following measure should be used to test the ability of a diagnostic test to correctly classify an individual as 'Negative' when he has no disease?

- A) Sensitivity
- B) Specificity
- C) False positive rate
- D) False negative rate

RIMS, PhD ENTRANCE EXAM [Session-2024]**Part-B: PARAMEDICAL**

51) A junior doctor telephones for advice. He needs to take various samples from his patient and wants to know the most appropriate order in which to draw the samples. The following tests have been requested: Full blood count, renal profile, Plasma glucose, clotting studies, blood cultures. Which sample should he take third?

- A) Clotting studies
- B) Full blood count
- C) Plasma glucose
- D) Renal profile

52) Serum indices are calculations of absorbance measurements that provide a semi-quantitative representation of levels of icterus, haemolysis or lipaemia in patient Samples. At what wavelength (nm) is detection of lipaemia best

- A) 300-410
- B) 400-510
- C) 500-610
- D) 600-710

53) What is the full form of ELISA?

- A) Enzyme linked immunosorbent assay
- B) Erythrocyte linked immunosorbent assay
- C) Enzyme linked immunological assay
- D) Erythrocyte linked immunological assay

54) Which part of light microscope converges the light beam so that it passes through the specimen?

- A) Objective lens
- B) Mechanical stage
- C) Condenser
- D) Iris diaphragm

55) Which of the following is site for collection of blood from new born baby

- A) Heel of baby's foot
- B) Ante-cubital fossa
- C) Ear lobe
- D) Finger prick

56) Glassware are sterilized by

- A) Autoclaving
- B) Hot air oven
- C) Incineration
- D) Inspissation

57) A 27 year old woman with long standing Crohn's disease, who has been receiving home parenteral nutrition for several years, presents with a skin rash. Her clinical team think that its appearance is typical of that of pellagra Deficiency of which vitamin is most likely to be the cause?

- A) Biotin
- B) Niacin
- C) Pyridoxine
- D) Riboflavin

58) Serum concentrations of cancer antigens may be increased in malignancy. Which cancer antigen is particularly used as a marker in breast cancer?

- A) CA 15-3
- B) CA 19-5
- C) CA 19-9
- D) CA 50

59) What is the normal level of serum potassium?

- A) 3.5-5.5 meq/l
- B) 2.5-3.5 meq/l
- C) 4.5-5.5 meq/l
- D) 5-6 meq/l

60) Salmonella typhi is the causative organism of

- A) Undulant fever
- B) Remittent fever
- C) Enteric fever
- D) Dengue fever

61) Culture media of choice for culture of urine sample:

- A) Blood agar
- B) Chocolate agar
- C) CLED agar
- D) XLD agar

62) Mycoplasmas are different from other bacteria by?

- A) Presence of chitin in cell wall
- B) Presence of Techoic acid in cell wall
- C) Presence of Lipoprotein in cell wall
- D) Absence of cell wall itself

63) The Difference of Plasma and Serum is that

- A) Plasma dose not contain fibrinogen
- B) Plasma has more water
- C) Plasma contains fibrinogen
- D) Plasma contains iron

64) If sample is taken in EDTA Tube, which one of the following biochemistry test results will affect?

- A) Glucose
- B) Urea
- C) Cholesterol
- D) Calcium

65) A blood donor who recently diagnoses positive HbsAg should be deferred for how long?

- A) Permanently
- B) For 3 months
- C) For 6 Months
- D) For 1 Year

66) Surgical specimen for frozen section examination should be sent in which solution?

- A) Without any preservative solution
- B) Formalin
- C) Normal saline
- D) Chlorhexidine

67) Which of the following disposable bag is used for the infectious body waste disposal?

- A) Red
- B) Green
- C) Yellow
- D) Purple

68) Which of the following solution is used for fumigation of operation theatres?

- A) 10% formaldehyde
- B) 40% formaldehyde
- C) 30% formaldehyde
- D) 50% formaldehyde

69) Which of the following solution is used for fumigation of operation theatres?

- A) 10% formaldehyde
- B) 24% formaldehyde
- C) 37% formaldehyde
- D) 45% formaldehyde

70) Most common technique of breast lump biopsy is:

- A) Incisional biopsy
- B) Excisional biopsy
- C) core biopsy
- D) Punch biopsy

71) Maximum radiation exposure occurs in

- A) Bone scan
- B) X-ray
- C) MRI
- D) CT scan

72) PET stand for

- A) Positive electron tomography
- B) Proton electron therapy
- C) Positron emission tomography
- D) Photon emitting tomography

73) Which of the following is non ionizing radiation?

- A) X-ray
- B) Beta Rays
- C) Alpha rays
- D) Microwave

74) Frequency of Ultrasound wave in ultra sonography (USG) is:

- A) 200 Hz
- B) 500 Hz
- C) <2 MHz
- D) >2 MHz

75) Doppler effect is due to

- A) Change in frequency in relation to the movement of source or observer
- B) Change in attenuation
- C) Change in absorption
- D) Change in reverberation

76) The magnetic field in MRI machine is measured in

- A) HU
- B) Tesla
- C) Watt / sec
- D) None of the above

77) The basic principle behind ultrasound probe technology is

- A) Piezoelectric effect
- B) Photoelectric effect
- C) Calorimetric effect
- D) Raman effect

78) The dark area in a conventional radiographic film are due to particulate deposits of

- A) Carbon
 - B) Iron
 - C) Silver
 - D) Copper
- 79) Investigation of choice to see gallbladder
- A) CT
 - B) USG
 - C) Plain x-ray
 - D) Oral Cholecystogram
- 80) Nuclear Magnetic Resonance (NMR) is based in the principle of
- A) Electron beam
 - B) Proton beam
 - C) Magnetic field
 - D) Neutron beam
- 81) For determination of amino acid sequence of a protein following is used.
- A) Ninhydrin reagent
 - B) Biuret reagent
 - C) Milons reagent
 - D) Sanger reagent
- 82) In carbohydrate metabolism all of the following hormones are involved except:
- A) Glucagon
 - B) ACTH
 - C) Vasopressin
 - D) Insulin
- 83) How many base pairs are present in each turn of B-form of DNA helix?
- A) 9
 - B) 10
 - C) 11
 - D) 12
- 84) Which of the following test is specific for the ketone bodies?
- A) Rothera s test
 - B) Gammelin s test
 - C) Hay s test
 - D) Fouchet s test
- 85) What is the function of trypsin?
- A) lipid digestion
 - B) protein digestion
 - C) carbohydrate digestion
 - D) nucleic acid digestion
- 86) Respiratory distress syndrome occurs due to deficiency of
- A) plasmalogen
 - B) sphingomyelin
 - C) Dipalmitoyl lecithin
 - D) Phosphotedyl serine
- 87) The green colour of urine sample indicates
- A) Melanin
 - B) Bromsulphalein
 - C) Acriflavine
 - D) Homogentisic acid
- 88) Adult haemoglobin (HbA) is a tetramer consisting of

- A) $\alpha_2\beta_2$
- B) $\alpha_2\delta_2$
- C) $\alpha_2\gamma_2$
- D) β_4

89) In Bombay blood group which antigen is present on RBC surface

- A) HAg
- B) AAg
- C) BAg
- D) GAg

90) Which vitamin is a component of coenzyme A?

- A) Vitamin B6
- B) Pantothenic acid
- C) Folic acid
- D) Cobalamin

91) Hand wash should be performed for minimum of how much duration?

- A) 20 second
- B) 40 second
- C) 2 minutes
- D) 3 minutes

92) Which medium is the most ideal for antibiotic sensitivity testing of bacterial isolates?

- A) Mueller-Hinton agar
- B) Nutrient agar
- C) Blood agar
- D) Macconkey agar

93) Magnification of oil immersion objective in compound microscope -

- A) 400x
- B) 1000x
- C) 100x
- D) 200x

94) All of the following are Romanowsky stain except

- A) May Greenwald Geimsa (MGG)
- B) Leishman stain
- C) Brilliant cresyl blue
- D) Field stain

95) Very low platelet count is usually associated with

- A) Prolonged CT
- B) Both BT & CT prolonged
- C) Prolonged BT
- D) Prolonged APT

96) In histopathology laboratory clearing agent used during tissue processing is

- A) Absolute alcohol
- B) 70% alcohol
- C) Xylene
- D) Formalin

97) The condition required for autoclave

- A) 121 degree C temp and 15 lbs pressure for 15 min
- B) 121 degree C temp and 20 lbs pressure for 30 min
- C) 150 degree C temp for 1 hr.
- D) 130 degree C temp for 2 hr

98) Which of the following is an automated continuous monitoring system of Blood culture:

- A) BacT/Alert 3D
- B) BACTEC
- C) VERSA TEK
- D) All of the above

99) Most of the microbiology labs require which type of Biosafety cabinet:

- A) Class 2A
- B) Class 3
- C) Class 2B
- D) None of the above

100) Free DNA can be transferred between bacteria by:

- A) Transformation
- B) Conjugation
- C) Transduction
- D) Transposons

PhD ENTRANCE EXAM [Session-2024]

Rajendra Institute of Medical Sciences, Ranchi

Roll No:

Answer Sheet Number:

Full Name:

Mobile Number and Email ID:

Signature of Candidate:

Signature of Invigilator:

Number of Questions: Part A - 50 & Part B-50

Time: 2 hours | Maximum Marks: 100

Number of pages in this Booklet: 13

Please Read these instructions carefully:

1. Tally the number of pages and number of questions in the booklet with the information printed on the cover page.
2. Faulty booklets will be replaced immediately by a correct booklet by the invigilator concerned within 5 minutes. Thereafter neither booklet will be replaced nor will any extra time be given.
3. Use Blue or Blue Black Ball point pen only.
4. Please follow the instructions carefully for marking correct answer in OMR answer sheet given at the back of OMR sheet.
5. Each question carries one mark and there is no negative marking for wrong answer.

BOOKLET NUMBER	SUBJECT NAME LIFE-SCIENCES	SUBJECT CODE 04
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RIMS, PhD ENTRANCE EXAM [Session-2024]**Part-A: RESEARCH METHODOLOGY**

-
- 1) To test the association of diabetes on kidney disease, 100 kidney disease patients and 100 healthy (no kidney disease) persons were recruited. There were 30% and 10% diabetic persons in disease and healthy group's, study design is:
- A) Case control study
 - B) Cross sectional study
 - C) Cohort study
 - D) Randomized controlled trials
- 2) What is the best design to study the prevalence of a disease?
- A) Cross-sectional study
 - B) Case-control study
 - C) Cohort study
 - D) Randomized controlled trials
- 3) Which type of study is loosely structured and designed to expand understanding of a topic and provide insights
- A) Formal
 - B) Causal
 - C) Exploratory
 - D) Descriptive
- 4) All of the following are possible goals of an exploratory study EXCEPT.....
- A) Discover future research tasks
 - B) Expand understanding of a topic
 - C) Test hypotheses
 - D) Provide insight
- 5) All of the following are true for Case study EXCEPT..
- A) Usually on rare disease /condition
 - B) Descriptive study
 - C) Observational study
 - D) Statistical significance
- 6) Which of the following sections of a protocol includes the description of study population, sample size and sampling
- A) Introduction
 - B) Methods
 - C) Objectives
 - D) Expected Benefits
- 7) The research is always –
- A) Verifying the old knowledge
 - B) Exploring new knowledge
 - C) Filling the gap between knowledge
 - D) All of these
- 8) Which of the following is NOT a characteristic of a well-designed Randomized Controlled Trials (RCT)?
- A) Random assignment of participants to treatment and control groups
 - B) Blinding of participants and researchers for treatment allocation
 - C) Use of a pre-determined sample size
 - D) Inclusion of participants using snowball sampling
- 9) Complete the statement. A written plan detailing the proposed implementation of a research study is known as

- A) Manuscript
- B) Protocol
- C) Commentary
- D) Critical appraisal

10) Which of the following is an example of artificial intelligence?

- A) Manufacturing robots.
- B) Virtual travel booking agent.
- C) Self-driving cars.
- D) All of the above

11) A researcher wishes to estimate the incidence of Myocardial infarction cases among a group of women using Oral Contraceptive Pills (OCP) who have been followed up for 10 years. Which of the following study designs is best suitable for this?

- A) Case series
- B) Cohort study
- C) Cross sectional survey
- D) Ecological study

12) Which of the following study designs can be used to determine the factors associated with a health-related outcome?

- A) Descriptive cross-sectional study
- B) Analytical cross-sectional study
- C) Case study
- D) Case series

13) If your objective is to estimate the prevalence of a health problem in a community in 2021, which of the following would most likely be the type of research question?

- A) Analytical research question
- B) Descriptive research question
- C) Hypothetical research question
- D) Experimental research question

14) Complete the statement. A study design that randomly assigns participants into an experimental group or a control group is known as

- A) Cohort study
- B) Case-control study
- C) Randomized controlled trials
- D) Cross-sectional study

15) The mean of a distribution is 14 and the standard deviation is 5. What is the value of the coefficient of variation?

- A) 60.40%
- B) 48.30%
- C) 35.70%
- D) 27.80%

16) The mean of a distribution is 23, the median is also 23. It is most likely that this distribution is:

- A) Positively Skewed
- B) Symmetrical
- C) Negatively Skewed
- D) None of above

17) Which of the following describe the middle part of a group of numbers?

- A) Measure of Variability
- B) Measure of Central Tendency
- C) Measure of Association
- D) Measure of Shape

18) According to the empirical rule, approximately what percent of the data should lie within ± 2 SD

- A) 75%
- B) 68.20%

- C) 99.70%
- D) 95.40%

19) Which of the following is a measure of central tendency?

- A) Percentile
- B) Quartile
- C) Standard deviation
- D) Mode

20) Which of the following divides a group of data into four subgroups?

- A) Percentiles
- B) Deciles
- C) Median
- D) Quartiles

21) If the standard deviation of a population is 9, the population variance is:

- A) 9
- B) 3
- C) 21
- D) 81

22) The sum of the deviations about the mean is always:

- A) Zero
- B) Total Standard Deviation
- C) Positive
- D) Negative

23) What is the appropriate measure of dispersion if mean is reported as the measure of central tendency for a given set of data?

- A) Standard deviation
- B) Interquartile range
- C) Variance
- D) Coefficient of variation

24) Parameter is a measure which is computed from

- A) Population data
- B) Sample data
- C) Test statistics
- D) None of these

25) The height of a student is 60 inches. This is an example of -

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RIMS, PhD ENTRANCE EXAM [Session-2024]**Part-B: LIFE SCIENCES**

51) Alveoli help in

- A) nerve signal transport
- B) blood clot
- C) breathing
- D) glucose metabolism

52) In Electrophoresis DNA will migrates towards

- A) Cathode or positive electrode
- B) Anode or negative electrode
- C) Cathode or negative electrode
- D) Anode or positive electrode

53) The type of cells required for vision in low light

- A) cones
- B) rhomboids
- C) spirals
- D) rods

54) Which of the following are important for white blood cell recognition?

- A) Glycoproteins
- B) Glycosaminoglycans
- C) Glycolipids
- D) Proteoglycans

55) Match the name of the scientists with their specific subject:

Scientist	Subject
(a) Alec Jeffery	(i) DNA Profiling
(b) Francis Galton	(ii) Toxicology
(c) A. Curry	(iii) Serology
(d) B. Dodd	(iv) Finger Prints

Choose the correct option

	(a)	(b)	(c)	(d)
A)	(i)	(iv)	(ii)	(iii)
B)	(iv)	(ii)	(i)	(iii)
C)	(iii)	(ii)	(iv)	(i)
D)	(ii)	(iii)	(i)	(iv)

56) To determine which strain of COVID-19 virus is prevalent in the population the most appropriate method is:

- A) RT-PCR based tests
- B) Truenat PCR based tests
- C) Droplet PCR
- D) genome sequencing

57) The following is not a plant hormone?

- A) Auxin
 - B) Gibberellins
 - C) Ethylene
 - D) Abscorbic acid
- 58) The role of the hormone 'thyroxine' secreted by thyroid gland is
- A) control blood glucose levels
 - B) control ovulation
 - C) decrease urine output
 - D) control metabolic rate
- 59) Insulin is produced by which types of cells?
- A) Substantia nigra cells
 - B) Kupffer cells
 - C) Stellate cells
 - D) Islets of langerhans cells
- 60) Following is a required ethical guideline step before enrolling a patient into your study:
- A) Inform the family members and doctors about the study
 - B) Inform about the study and politely draw blood after that
 - C) Inform about the study and then start investigations
 - D) Inform about the study and get a consent form signed
- 61) Which of the following molecule undergoes post-translational modification
- A) carbohydrates
 - B) lipids
 - C) proteins
 - D) nucleic acid
- 62) Following is characteristics of a Gram +ve bacterium:
- A) Thick peptidoglycan cell wall
 - B) Stain red after Gram staining
 - C) More resistant to antibodies
 - D) Thin peptidoglycan cell wall
- 63) HEPA filter is a part of which instrument?
- A) Autoclave
 - B) Laminar Air Flow
 - C) Hot air Oven
 - D) Centrifuge
- 64) Which of the following in a nerve cell can increase the speed of electrical imulse
- A) Axons
 - B) Myelin sheath
 - C) Dendrites
 - D) Cell body
- 65) If molecular weight of NaCl is 54.44 g/mol, how much NaCl you should add to 100ml of water to make 10% solution
- A) 5.444 g
 - B) 54.44 g
 - C) 10 g
 - D) 100 g
- 66) Which of the following is an instrument used to measure lung capacity?
- A) Stethoscope
 - B) Sphygmomanometer
 - C) Otoscope
 - D) Spirometer
- 67) Following technique is used to separate proteins based on molecular weight

- A) Polyacrylamide Gel Electrophoresis
- B) Agarose gel electrophoresis
- C) Both of the above
- D) None of the above

68) Following is not a continuous variable

- A) BMI
- B) Blood glucose
- C) Age
- D) Gender

69) Concentration of a purified protein is best measured spectrophotometrically using absorbance at:

- A) 280 nm
- B) 260 nm
- C) 230 nm
- D) 210 nm

70) Which organelle of the cell is known as suicide bag?

- A) Mitochondria
- B) Lysosome
- C) Nucleus
- D) Endoplasmic reticulum

71) Which of the following preservative is used for preserving hair for DNA analysis?

- A) Normal saline
- B) Dimethyl sulfoxide
- C) Rectified spirit
- D) No preservative is required

72) In which of the following type of cells Sarcoplasmic reticulum is found?

- A) liver cells
- B) kidney cells
- C) neurons
- D) muscle cells

73) Tapetum lucidum is present in which part of the body of animals

- A) Ear
- B) Eye
- C) Nose
- D) Tongue

74) Following is hallmark of Parkinson's disease

- A) Increased secretion of dopamine
- B) Reduced secretion of dopamine
- C) High secretion of Nor-epinephrine
- D) Reduced cortical secretion

75) Which is the sweetest of the sugars listed here?

- A) Glucose
- B) Fructose
- C) Galactose
- D) Lactose

76) The following is peptide hormone

- A) Insulin
- B) Adrenaline
- C) Thyroxine
- D) Testosterone

77) Which one of the following is the source of electrons in photosynthesis?

- A) NADPH
- B) Water
- C) Carbohydrates
- D) CO₂

78) Which of the following is wrongly paired?

- A) Nucleic acid – hydrogen bond
- B) Polysaccharide – glycosidic bond
- C) Proteins – peptide bond
- D) Phospholipids –disulphide bonds

79) The following vitamin has a role in clotting?

- A) Vitamin-A
- B) Vitamin-D
- C) Vitamin-E
- D) Vitamin-K

80) 37 degree Celsius in Fahrenheit scale is?

- A) 100
- B) 96.8
- C) 95.2
- D) 98.6

81) Sickle cell and beta thalassemia are:

- A) Inherited genetic disorders.
- B) Acquired disorders.
- C) Metabolic disorders
- D) Age related disorders

82) The following RNA has a poly-A tail

- A) t-RNA
- B) m-RNA
- C) mi-RNA
- D) r-RNA

83) ELISA is?

- A) Using radiolabelled second antibody
- B) Usage of RBCs
- C) Using complement-mediated cell lysis
- D) Addition of substrate that is converted into a coloured end product

84) The preliminary examination of blood can be done by: (i) Phenolphthalein test (ii) Preceptin test (iii) Takayama Crystal test (iv) Luminal test. Choose the correct combination according to the code:

- A) (i) and (ii) are correct
- B) (i) and (iv) are correct
- C) (ii) and (iii) are correct
- D) (i), (ii) and (iii) are correct

85) Which of the following is not a micro-nutrient?

- A) Hydrogen
- B) Calcium
- C) Zinc
- D) Iron

86) Chi-square test is to compare which type of variables

- A) two continuous variables
- B) one continuous and one dichotomous variable
- C) two normally distributed variables
- D) two dichotomous variables

87) This hormone is also known as 'flight or fight' hormone

- A) Cortisol
- B) Adrenaline
- C) Oxytocin
- D) Insulin

88) Which of the following is used by cells to interact with other cells?

- A) Cell wall
- B) Cell junctions
- C) Cell adhesions
- D) Cell detectors

89) Study of which disease led to the discovery of vaccine by Edward Jenner?

- A) Measles
- B) Smallpox
- C) Plague
- D) Acquired immunodeficiency syndrome

90) Liquid portion of blood after forming clot is?

- A) Plasma
- B) FFP
- C) Serum
- D) Protein

91) Usually which value is considered significant for P-value

- A) 0.05
- B) <0.05
- C) >0.05
- D) <0.01

92) Which chemical is used to create cross links in a polyacrylamide gel

- A) Acrylamide
- B) Bis-Acrylamide
- C) TEMED
- D) Beta mercaptoethanol

93) Where does translation (mRNA to Protein) takes place in a cell

- A) Neucleus
- B) Neucleuo plasm
- C) Cytoplasm
- D) Vacuoles

94) Who developed the first vaccine which was used to treat small pox?

- A) Louis Pasteur
- B) Edward Jenner
- C) Nicolas Appert
- D) Robert Koch

95) Acid phosphatase test is performed to detect:

- A) Urine
- B) Saliva
- C) Semen
- D) Blood

96) What is CRISPR-Cas technology used for?

- A) DNA replication
- B) Gene cloning
- C) Gene editing
- D) Protein synthesis

97) The main function of Henle's loop is

- A) Recovery of water and sodium chloride from urine
- B) Recovery of amino acids from urine
- C) Recovery of amino acids from blood
- D) Filter microbes in the urine

98) Role of Chaperones is to help in

- A) protein folding
- B) lipid degradation
- C) DNA repair
- D) linking carbohydrates

99) Which vacutainer is best suited to store blood for measuring glucose?

- A) Fluoride vacutainer
- B) EDTA vacutainer
- C) Sodium vacutainer
- D) Gel vacutainer

100) Normal distribution is best denoted by

- A) bell shaped curve
- B) sigmoid curve
- C) inverted bell shaped curve
- D) a straight line

Answer Key:-

Part - A Research Methodology				Part - B Life Science			
S. No.	Key	S. No.	Key	S. No.	Key	S. No.	Key
1	A	26	C	51	C	76	A
2	A	27	C	52	D	77	B
3	C	28	C	53	D	78	D
4	C	29	B	54	A	79	D
5	D	30	D	55	A	80	D
6	B	31	B	56	D	81	A
7	D	32	D	57	D	82	B
8	D	33	C	58	D	83	D
9	B	34	B	59	D	84	B
10	D	35	D	60	D	85	A
11	B	36	D	61	C	86	D
12	B	37	D	62	A	87	A
13	B	38	A	63	B	88	B
14	C	39	B	64	B	89	B
15	C	40	D	65	C	90	C
16	B	41	D	66	D	91	B
17	B	42	D	67	A	92	B
18	D	43	A	68	D	93	C
19	D	44	B	69	A	94	B
20	D	45	C	70	B	95	C
21	D	46	A	71	D	96	C
22	A	47	B	72	D	97	A
23	A	48	B	73	B	98	A
24	A	49	B	74	B	99	A
25	C	50	B	75	B	100	C

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