



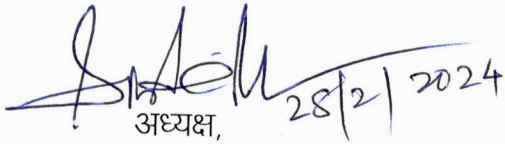
Memo No 436 /RIMS,Ranchi. Dated 28/02/24

कार्यालय सूचना

पी0एच0डी0 कोर्स सत्र 2023 हेतु दिनांक 26.02.2024 को आयोजित की गई प्रवेश परीक्षा की MCQ एवं Answer Sheet इस पत्र के साथ संलग्न कर प्रकाशित की जा रही हैं किसी भी परीक्षार्थी को इस संबंध में कोई आपत्ति/दावा दर्ज करनी हो तो वे दिनांक 05.03.2024 तक justification के साथ अपना आपत्ति /दावा डीन रिसर्च, रिम्स, राँची के कार्यालय में ईमेल के माध्यम प्रेषित करेंगे उक्त निर्धारित तिथि के पश्चात किसी का भी आपत्ति /दावा में कोई संज्ञान नहीं लिया जाएगा ।

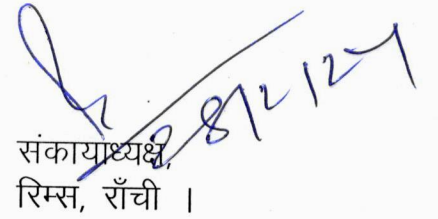
ईमेल आई डी- [phdrimsr@gmail.com](mailto:phdrimsr@gmail.com)

संलग्नक:-पत्रानुसार ।

  
अध्यक्ष, 28/2/2024

पी0एच0डी0 समन्वय समिति,  
रिम्स, राँची ।



  
संकायाध्यक्ष,  
रिम्स, राँची ।

**This Booklet Contains ten pages  
PhD Entrance Test [2023]  
Rajendra Institute of Medical Sciences, Ranchi**

Roll No: .....

Name: .....

Candidate's Signature .....

Answer Sheet Number. ....

Signature and Name of Invigilator .....

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

Time: 2 hours

**Maximum Marks: 100**

Please Read this instruction carefully: -

1. Tally the number of pages and number of questions in the booklet with the information printed on the cover page.
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## **PART-A -Research Methodology**

- 1 Which of the following is true for randomised controlled trials in comparison to observational studies?
  - A Greater internal and external validity
  - B Greater internal validity but lower external validity
  - C Lower internal validity but greater external validity
  - D Lower internal and external validity
- 2 In a case control study, the investigator is collecting data from cases at bedside and from matched controls via call. This can lead to.
  - A Selection bias
  - B Information bias
  - C Confounding
  - D Chance
- 3 How to analyse qualitative data?
  - A Independent t-test
  - B Dependent t-test
  - C Chi-square
  - D Wilcoxon sign-rank test
- 4 What will be the sample size in cross-over study design?
  - A Double of parallel design
  - B Half of parallel design
  - C Equal of parallel design
  - D None of the above
- 5 What is odds ratio?
  - A Odds of event in one group divided by odds of event in the other group
  - B Odds of event in one group minus odds of event in the other group
  - C Odds of event in one group multiplied by risk of event in the other group
  - D Odds of event in one group plus odds of event in the other group
- 6 Which of the following is NOT an observational study?
  - A Phase-1 trial
  - B Case series
  - C Case control study
  - D Cohort study

- 7 Power of a study is?  
A 1 - type 2 error  
B type 2 error  
C 1 - type 1 error  
D type 1 error
- 8 What is the level of significance?  
A 1 - type 2 error  
B type 2 error  
C 1 - type 1 error  
D type 1 error
- 9 In a clinical trial, registration with Clinical Trials Registry-India is mandatory before?  
A Enrolment of first participant in the study  
B Submission of protocol to institutional research board  
C Submission of protocol to departmental research committee  
D Before publication of manuscript
- 10 Which of the following is the correct statement  
A Sample size is a best guess by the investigator  
B Any sample size more than 50 is adequate  
C Large sample size is always good  
D None of the above
- 11 Which is not a non-parametric test?  
A Student's t-test  
B Mann Whitney test  
C Kruskal Wallis test  
D Wilcoxon sign-rank test
- 12 If you have to estimate the prevalence of a disease in the community, what is the type of research question?  
A Descriptive  
B Analytical  
C Experimental  
D None of the above
- 13 Which of the following is not an indexing agency?  
A MEDLINE  
B Scopus  
C Nature  
D Web of Science
- 14 Who operates PubMed?  
A National Library of Medicine  
B International Library of Medicine  
C World Health Organisation  
D None of the above
- 15 What is the expansion of IMRaD?  
A Introduction, Methods, Relevance, and Discussion  
B Introduction, Methods, Results, and Discussion  
C Introduction, Methods, Results, and Directions  
D Introduction, Methods, Relevance, and Drawbacks
- 16 What is not the component of a protocol?  
A Rationale of a study  
B Study methodology  
C Study conclusion  
D Informed consent form
- 17 Which is an analytical study design?  
A Cross-sectional  
B Case report  
C Cohort  
D Case series
- 18 Which of the following is true about case control?  
A You start the research from exposure and go towards the outcome  
B You start the research from outcome and go towards the exposure  
C You assess the exposure and outcome with respect to the same point of time  
D All the above are acceptable
- 19 Scatterplots are used to visualise  
A Quantitative data on one axis and qualitative data on another axis  
B Qualitative data on two axes  
C Quantitative data on two axes  
D All the above
- 20 Which of the following data types cannot be presented as median and interquartile range?  
A Nominal  
B Ordinal  
C Interval  
D Ratio

- 21 Which of the following is true about normally distributed data?  
A Left-skewed  
B Skewed on either side  
C Right-skewed  
D None of the above
- 22 Which of the following is NOT true about normally distributed data?  
A It has a bell-shaped curve.  
B It has a single mode.  
C Mean, median, and mode coincide  
D Standard deviation is always greater than mean
- 23 Which of the following is NOT a statistical test for normality?  
A Kolmogorov-Smirnov test  
B Shapiro-Wilk test  
C Student's t-test  
D D'Agostino-Pearson omnibus test
- 24 Which test is used for data with multiple groups?  
A Paired t-test  
B Pearson correlation  
C One-way ANOVA  
D Mann Whitney U test
- 25 Which of the following statement is TRUE?  
A The probability of both of two independent events occurring is derived by multiplication  
B The probability of both of two dependent events occurring is derived by multiplication  
C The probability of both of two independent events occurring is derived by addition  
D None of the above
- 26 Which of the following is true?  
A The probability of both of two mutually exclusive events occurring is derived by multiplication  
B The probability of both of two mutually exclusive events occurring is derived by addition  
C The probability of both of two mutually exclusive events occurring is derived by subtraction  
D None of the above
- 27 Which of the following statements is FALSE?  
A If repeated measurements of a characteristic in the same individual under identical conditions produce similar results, we would say that the measurement is reliable.  
B If the measurement has high reliability, the standard deviation should be larger.  
C A result is said to be reliable if the same result is obtained when the study is repeated under the same conditions  
D The natural variability in observations among individuals in the population is commonly known as random error.
- 28 When there are even number of observations, median is?  
A The lower of the middle value  
B The higher of the middle value  
C Average of the two middle values  
D The arithmetic average
- 29 Which of the following is most affected by outliers?  
A Mean  
B Median  
C Mode  
D None of the above
- 30 Which of the following statements is FALSE?  
A A measurement is said to be valid if it measures what it is supposed to.  
B If a measurement is not valid, we say it is 'biased'.  
C Bias is a random error that skews the observation to either side of the truth.  
D If we use a scale that is not calibrated to zero, it hampers the validity of the study.
- 31 Which of the following is not a measure of position?  
A Quantile  
B Z score  
C Standard deviation  
D Centile
- 32 Individuals who have worked but do not match the authorship criteria should be?  
A Acknowledged in the manuscript  
B Given the option for gift authorship

- C Not to mention in the manuscript  
D Any of the above, depending on the corresponding author
- 33 Authors who have used artificial intelligence (AI)-assisted technologies in the production of submitted work can do which of the following?  
A Add AI as a co-author  
B Cite AI as their source of work  
C Both of the above  
D None of the above
- 34 Which of the following is a potential source for conflict of interest?  
A Professional judgment concerning the validity of research may be influenced by financial gain  
B Professional judgment concerning patients' welfare may be influenced by financial gain  
C Both of the above  
D None of the above
- 35 Which of the following is FALSE for experimental studies (compared to observational studies)?  
A The ability to manipulate or assign independent variables.  
B The ability to randomize subjects to experimental and control groups.  
C The ability to control confounding and eliminate sources of spurious association.  
D Generally, samples are more representative of the population
- 36 Which of the following is not a systematic error?  
A Selection bias  
B Information bias  
C Chance  
D Confounding
- 37 Which of the following denote causal association?  
A Observation bias in association  
B Consistency of association  
C Chance in association  
D Sensitivity of the association
- 38 Relative risk cannot be calculated for which of the following study designs?
- A Phase 3 trial  
B Cohort study  
C Cross-sectional study  
D Phase 4 trial
- 39 How many subjects are expected to lie in the third quartile of a sample?  
A 10%  
B 25%  
C 50%  
D 90%
- 40 Rejection of null hypothesis leads to acceptance of?  
A Alternate hypothesis  
B Experimental hypothesis  
C Either of the above  
D None of the above
- 41 When we deduce that the observed effect is only due to chance, we  
A Accept the alternate hypothesis  
B Reject the null hypothesis  
C Fail to reject the null hypothesis  
D Accept both the null and alternate hypothesis
- 42 What is the conventional value of type 1 error?  
A 1%  
B 5%  
C 10%  
D 80%
- 43 If the p-value threshold for significance is considered at 0.05, and the obtained p-value is 0.03, we  
A Accept the null hypothesis  
B Reject the null hypothesis  
C Fail to reject the null hypothesis  
D Reject the alternate hypothesis
- 44 What is CONSORT?  
A Consolidated Standards of Reporting Trials  
B Consensus Statement of Reporting Trials  
C Clear Standards of Reporting Trials  
D Consolidated Scheme of Reporting Trials
- 45 A co-efficient close to -1 indicates  
A A strong correlation

- B A weak correlation
  - C Either of the above
  - D None of the above
- 46 The correlation coefficient ( $r = 0.8$ ) of fasting blood sugar and fatigue is statistically significant ( $p < 0.01$ ). It indicates
- A 80% ( $0.8 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - B 64% ( $0.8^2 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - C 20% ( $100 - 80$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - D 36% ( $100 - 0.8^2 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
- 47 A study investigator wishes to use a sampling technique wherein the population is divided into homogenous subgroups for taking samples from each subgroup. Which sampling technique should he use?
- A Simple sampling
  - B Cluster sampling
  - C Stratified sampling
  - D Systematic sampling
- 48 A study investigator wishes to use a sampling technique for an epidemiological study wherein he wishes to randomly pick specific geographic units for the study. Which sampling technique should he use?
- A Simple sampling
  - B Cluster sampling
  - C Stratified sampling
  - D Systematic sampling
- 49 Which of the following does a basic box and whisker plot not depict?
- A Median
  - B First quartile
  - C Mean
  - D Upper extreme
- 50 Which of the following is correctly arranged in descending order of size?
- A Population > Accessible Population > Target Population > Sample
  - B Population > Target Population > Accessible Population > Sample
  - C Population = Accessible Population > Target Population > Sample
  - D Population = Target Population > Accessible Population > Sample

## RIMS, PBD ENTRANCE EXAM 2024

### SECTION-B: LIFE SCIENCES

- 51) At what stage of meiosis I, chromosome crossing over occurs?
- A) Leptotene
  - B) Zygotene
  - C) Pachytene
  - D) Diplotene
- 52) The thin actin rich plasma membrane protrusions of eukaryotic cells are known as?
- A) Plasmodesmata
  - B) Filopodia
  - C) Cell polarity
  - D) Desmosomes
- 53) Virally infected or cancer cells in the body are directly eliminated by:
- A) Helper T cells
  - B) Cytotoxic T cells
  - C) B cells
  - D) Memory T cells
- 54) Which among the following mammalian cell membranes have high lipid content?
- A) Myelin sheath membrane
  - B) Inner mitochondrial membrane
  - C) Nuclear membrane
  - D) Epithelial cell membrane
- 55) Which surface antigen distinguishes cytotoxic T cells from other lymphocytes?
- A) CD3
  - B) CD4
  - C) CD5
  - D) CD8
- 56) Which of these elements is negligible in the human body?
- A) Silicon
  - B) Magnesium
  - C) Sodium
  - D) Sulphur
- 57) What is the process by which the body breaks down food into usable energy called?
- A) Photosynthesis
  - B) Fermentation
  - C) Respiration
  - D) Digestion
- 58) What is the process of transfer of genetic material from one bacterium to another called?
- A) Transformation
  - B) Transduction
  - C) Conjugation
  - D) Transcription
- 59) What is the main basis for classification of bacteria according to their taxonomy and evolution?
- A) Shape
  - B) Gram staining
  - C) Metabolic pathways
  - D) Genetic similarity
- 60) What is CRISPR-Cas technology used for?
- A) DNA replication
  - B) Gene cloning
  - C) Gene editing
  - D) Protein synthesis
- 61) What are the two main components of the CRISPR-Cas system?
- A) RNA and Cas9
  - B) RNA and DNA
  - C) DNA and Cas9
  - D) RNA and protein
- 62) What is the role of substrate availability in the regulation of bacterial metabolic pathways?
- A) To increase metabolic flux.
  - B) To decrease metabolic flux
  - C) To modify metabolic flux
  - D) To stabilize metabolic flux
- 63) What is the main function of bio-membrane potentials?
- A) To generate electrical signals for communication between cells
  - B) To regulate the movement of ions across cell membranes
  - C) To provide energy for cellular processes
  - D) To protect cells from external stressors
- 64) What is the role of ion pumps in maintaining the resting membrane potential?
- A) To allow ions to freely cross the membrane
  - B) To increase the concentration of ions on one side of the membrane
  - C) To decrease the concentration of ions on one side of the membrane
  - D) To neutralize the charge across the membrane
- 65) What is the role of the nuclear pore complex in mRNA export?
- A) To help mRNA enter the cytoplasm.
  - B) To help mRNA bind to ribosomes
  - C) To help mRNA leave the nucleus
  - D) To help mRNA enter the mitochondria
- 66) What is the role of regulatory proteins in the regulation of bacterial metabolic pathways?
- A) To increase gene expression.
  - B) To decrease gene expression
  - C) To modify gene expression
  - D) To stabilize gene expression

- 67) What is the main mechanism of regulation of bacterial metabolic pathways?
- Genetic recombination
  - Transcriptional regulation
  - Translational regulation
  - Post-translational regulation
- 68) What is the role of regulatory RNAs in the regulation of bacterial metabolic pathways?
- To increase gene expression.
  - To decrease gene expression
  - To modify gene expression
  - To stabilize gene expression
- 69) What is the main difference between cholinergic and anticholinergic drugs?
- Cholinergic drugs stimulate acetylcholine receptors, while anticholinergic drugs inhibit them.
  - Cholinergic drugs inhibit acetylcholine receptors, while anticholinergic drugs stimulate them.
  - Cholinergic drugs are used to treat neurological disorders, while anticholinergic drugs are used to treat respiratory disorders
  - Cholinergic drugs are used to treat respiratory disorders, while anticholinergic drugs are used to treat neurological disorders
- 70) How are monoclonal antibodies produced?
- Natural production
  - Artificial production
  - Hybridoma technology
  - Genetic engineering
- 71) What is the main function of cytokines during acute inflammation?
- Initiating the immune response.
  - Regulating the immune response.
  - Suppressing the immune response.
  - Maintaining homeostasis.
- 72) What is the effect of an increase in enzyme concentration on an enzyme-catalyzed reaction?
- It decreases the rate of reaction.
  - It increases the rate of reaction
  - It has no effect on the rate of reaction.
  - It increases the Michaelis constant.
- 73) What happens to the resting membrane potential if the concentration of ions on one side of the membrane changes?
- It remains the same.
  - It becomes more positive
  - It becomes more negative
  - It becomes neutral
- 74) Endosomes are membrane-bound vesicles involved in endocytosis. What is the origin of early endosomes in a cell?
- nuclear membrane
  - Endoplasmic reticulum
  - Lysosomes
  - Plasma membrane
- 75) Which among the following statements is incorrect?
- Open reading frame has both start and stop codons.
  - Open reading frame contains only exons
  - Open reading frame does not contain a start codon.
  - Open reading frame has only introns
- 76) Sickle cell and beta thalassemia are:
- Inherited genetic disorders.
  - Acquired disorders.
  - Metabolic disorders
  - Age related disorders
- 77) Alzheimer's is a disease in human which primarily affects?
- Hepatocytes
  - Astrocytes
  - Neurons
  - Brain astrocytes
- 78)  $\text{Na}^+/\text{K}^+$ -ATPase is found in the plasma membrane of all animal cells. This is an enzyme which acts as
- A solute pump
  - A Protease
  - A Secretase
  - A receptor
- 79) Which among the following statement is incorrect?
- Endoplasmic reticulum stores calcium
  - Golgi apparatus is involved in protein sorting
  - Protein translation occurs in the nucleus of a cell
  - mRNA is synthesised in the nucleus of the cell
- 80) If a solution of  $\text{pH}=8.0$  is diluted 10 times, the pH of resulting solution will be
- 0.8
  - 0.08
  - 80
  - 8
- 81) Instantaneous dipole-induced dipole forces are also known as
- Dipole-dipole interactions
  - Hydrogen bonds
  - Covalent bonds
  - Van der Waals forces
- 82) What is the main difference between error-prone and error-free DNA repair mechanisms in bacteria?
- Error-prone mechanisms result in the introduction of mutations, while error-free mechanisms result in the preservation of the original DNA sequence.
  - Error-free mechanisms result in the introduction of mutations, while error-prone mechanisms result in the preservation of the original DNA sequence.
  - Error-prone mechanisms are faster than error-free mechanisms.
  - Error-free mechanisms are faster than error-prone mechanisms.
- 83) What is the main mechanism of action of antiviral antibodies?
- Direct viral lysis
  - Neutralization of virus particles



- C) Enhancement of viral replication  
D) Suppression of viral transcription
- 84) What is the main mechanism of antibiotic resistance in bacteria?  
A) Alteration of antibiotic target site  
B) Destruction of antibiotics by enzymes  
C) Efflux pump-mediated elimination  
D) Reduction of antibiotic uptake
- 85) What is the function of viral spikes on the envelope?  
A) Facilitation of viral entry into host cells  
B) Prevention of antibody recognition  
C) Protection of viral genome  
D) Maintenance of viral shape
- 86) What is the role of the SOS response in bacterial DNA repair?  
A) To induce the expression of DNA repair genes.  
B) To suppress the expression of DNA repair genes.  
C) To repair damaged DNA.  
D) To cause cell death.
- 87) What is the mechanism of action of efflux pumps in antibiotic resistance?  
A) Active extrusion of antibiotics from the bacterial cell  
B) Destruction of antibiotics by enzymes  
C) Reduction of antibiotic uptake  
D) Alteration of antibiotic target site
- 88) Which of the following is NOT an example of an epigenetic modification?  
A) DNA methylation  
B) Chromatin remodeling  
C) RNA translation  
D) Histone modification
- 89) What is the role of the Golgi apparatus in protein sorting and secretion?  
A) To modify and sort proteins for secretion.  
B) To store secreted proteins.  
C) To transport proteins to the plasma membrane  
D) To degrade secreted proteins.
- 90) What role do plasmids have in the spread of antibiotic resistance in bacteria?  
A) Plasmids can carry genes encoding resistance to multiple antibiotics.  
B) Plasmids can transfer antibiotic resistance genes to other bacteria through horizontal transfer.  
C) Plasmids can reduce the efficiency of antibiotics.  
D) Plasmids can enhance antibiotic uptake by bacteria.
- 91) What type of T-cells are involved in long-term antiviral immunity?  
A) CD4+ T-cells  
B) CD8+ T-cells  
C) Natural killer cells  
D) B-cells
- 92) What is the role of the vesicular transport system in protein secretion?
- A) To transport proteins from the Golgi apparatus to the plasma membrane.  
B) To transport proteins from the plasma membrane to the Golgi apparatus  
C) To transport proteins from the ER to the Golgi apparatus  
D) To degrade secreted proteins.
- 93) What is the primary treatment strategy for individuals with elevated levels of LDL cholesterol to reduce their risk of cardiovascular disease?  
A) Increased physical activity.  
B) Smoking cessation  
C) Use of cholesterol-lowering medications  
D) Diet modification
- 94) What is the primary function of the endoplasmic reticulum (ER) in protein sorting and secretion?  
A) To modify and sort proteins for secretion.  
B) To store secreted proteins.  
C) To transport proteins to the Golgi apparatus  
D) To degrade secreted proteins.
- 95) What is the role of histone modification in epigenetic regulation?  
A) To enhance gene expression.  
B) To suppress gene expression.  
C) To initiate DNA replication.  
D) To repair damaged DNA.
- 96) What type of drug delivery system provides a constant drug concentration over time?  
A) Immediate-release formulations  
B) Controlled release formulations.  
C) Extended-release formulations  
D) Sustained release formulations.
- 97) What is the relationship between bar bodies and cellular stress?  
A) Bar bodies form in response to cellular stress  
B) Bar bodies prevent cellular stress.  
C) Bar bodies have no relationship to cellular stress.  
D) Bar bodies cause cellular stress.
- 98) How do miRNAs differ from other types of non-coding RNAs, such as long non-coding RNAs (lncRNAs)?  
A) miRNAs are much longer than lncRNAs  
B) miRNAs do not regulate gene expression while lncRNAs do.  
C) miRNAs and lncRNAs have similar functions.  
D) miRNAs are much shorter than lncRNAs and have different functions.
- 99) What is the difference between satellite DNA and single copy DNA sequences?  
A) Satellite DNA is repetitive while single copy DNA is unique  
B) Satellite DNA is functional while single copy DNA is not  
C) Satellite DNA is present in only one copy while single copy DNA is present in many copies  
D) Satellite DNA is involved in gene regulation while single copy DNA is not.
- 100) What is the significance of LTRs in retroviruses?  
A) LTRs are involved in the replication and integration of retroviral DNA into the host genome  
B) LTRs regulate gene expression in the host genome.  
C) LTRs have no significant role in retroviruses.  
D) LTRs prevent the replication of retroviral DNA.

Part - A Research Methodology					Part - B Life Sciences				
1	B		26	B	51	C		76	A
2	B		27	B	52	B		77	C
3	C		28	C	53	B		78	A
4	B		29	A	54	A		79	C
5	A		30	C	55	D		80	D
6	A		31	C	56	A		81	D
7	A		32	A	57	D		82	A
8	D		33	C	58	C		83	B
9	A		34	C	59	D		84	A
10	D		35	D	60	C		85	A
11	A		36	C	61	A		86	A
12	A		37	B	62	A		87	A
13	C		38	C	63	B		88	C
14	A		39	B	64	C		89	A
15	B		40	C	65	C		90	B
16	C		41	C	66	C		91	B
17	C		42	B	67	B		92	A
18	B		43	B	68	B		93	D
19	C		44	A	69	A		94	A
20	A		45	A	70	C		95	A
21	D		46	A	71	A		96	B
22	D		47	C	72	B		97	A
23	C		48	B	73	B		98	D
24	C		49	C	74	D		99	A
25	A		50	B	75	D		100	A

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  - B Greater internal validity but lower external validity
  - C Lower internal validity but greater external validity
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2. In a case control study, the investigator is collecting data from cases at bedside and from matched controls via call. This can lead to.
  - A Selection bias
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3. How to analyse qualitative data?
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  - D Odds of event in one group plus odds of event in the other group
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  - D Cohort study
7. Power of a study is?
  - A 1 - type 2 error

- B type 2 error  
C 1 - type 1 error  
D type 1 error
- 8 What is the level of significance?  
A 1 - type 2 error  
B type 2 error  
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- 9 In a clinical trial, registration with Clinical Trials Registry-India is mandatory before?  
A Enrolment of first participant in the study  
B Submission of protocol to institutional research board  
C Submission of protocol to departmental research committee  
D Before publication of manuscript
- 10 Which of the following is the correct statement  
A Sample size is a best guess by the investigator  
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B Analytical  
C Experimental  
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C Nature  
D Web of Science
- 14 Who operates PubMed?  
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B International Library of Medicine  
C World Health Organisation  
D None of the above
- 15 What is the expansion of IMRaD?  
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B Introduction, Methods, Results, and Discussion  
C Introduction, Methods, Results, and Directions  
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B The probability of both of two dependent events occurring is derived by multiplication  
C The probability of both of two independent events occurring is derived by addition  
D None of the above
- 26 Which of the following is true?  
A The probability of both of two mutually exclusive events occurring is derived by multiplication  
B The probability of both of two mutually exclusive events occurring is derived by addition  
C The probability of both of two mutually exclusive events occurring is derived by subtraction  
D None of the above
- 27 Which of the following statements is FALSE?  
A If repeated measurements of a characteristic in the same individual under identical conditions produce similar results, we would say that the measurement is reliable.  
B If the measurement has high reliability, the standard deviation should be larger.  
C A result is said to be reliable if the same result is obtained when the study is repeated under the same conditions  
D The natural variability in observations among individuals in the population is commonly known as random error.
- 28 When there are even number of observations, median is?  
A The lower of the middle value  
B The higher of the middle value  
C Average of the two middle values  
D The arithmetic average
- 29 Which of the following is most affected by outliers?  
A Mean  
B Median  
C Mode  
D None of the above
- 30 Which of the following statements is FALSE?  
A A measurement is said to be valid if it measures what it is supposed to.  
B If a measurement is not valid, we say it is 'biased'.  
C Bias is a random error that skews the observation to either side of the truth.  
D If we use a scale that is not calibrated to zero, it hampers the validity of the study.
- 31 Which of the following is not a measure of position?  
A Quantile  
B Z score  
C Standard deviation  
D Centile
- 32 Individuals who have worked but do not match the authorship criteria should be?  
A Acknowledged in the manuscript  
B Given the option for gift authorship  
C Not to mention in the manuscript  
D Any of the above, depending on the corresponding author
- 33 Authors who have used artificial intelligence (AI)-assisted technologies in the production of submitted work can do which of the following?  
A Add AI as a co-author  
B Cite AI as their source of work  
C Both of the above  
D None of the above
- 34 Which of the following is a potential source for conflict of interest?  
A Professional judgment concerning the validity of research may be influenced by financial gain  
B Professional judgment concerning patients' welfare may be influenced by financial gain  
C Both of the above  
D None of the above

- 35 Which of the following is FALSE for experimental studies (compared to observational studies)?
- A The ability to manipulate or assign independent variables.
  - B The ability to randomize subjects to experimental and control groups.
  - C The ability to control confounding and eliminate sources of spurious association.
  - D Generally, samples are more representative of the population
- 36 Which of the following is not a systematic error?
- A Selection bias
  - B Information bias
  - C Chance
  - D Confounding
- 37 Which of the following denote causal association?
- A Observation bias in association
  - B Consistency of association
  - C Chance in association
  - D Sensitivity of the association
- 38 Relative risk cannot be calculated for which of the following study designs?
- A Phase 3 trial
  - B Cohort study
  - C Cross-sectional study
  - D Phase 4 trial
- 39 How many subjects are expected to lie in the third quartile of a sample?
- A 10%
  - B 25%
  - C 50%
  - D 90%
- 40 Rejection of null hypothesis leads to acceptance of?
- A Alternate hypothesis
  - B Experimental hypothesis
  - C Either of the above
  - D None of the above
- 41 When we deduce that the observed effect is only due to chance, we
- A Accept the alternate hypothesis
  - B Reject the null hypothesis
  - C Fail to reject the null hypothesis
  - D Accept both the null and alternate hypothesis
- 42 What is the conventional value of type 1 error?
- A 1%
  - B 5%
  - C 10%
  - D 80%
- 43 If the p-value threshold for significance is considered at 0.05, and the obtained p-value is 0.03, we
- A Accept the null hypothesis
  - B Reject the null hypothesis
  - C Fail to reject the null hypothesis
  - D Reject the alternate hypothesis
- 44 What is CONSORT?
- A Consolidated Standards of Reporting Trials
  - B Consensus Statement of Reporting Trials
  - C Clear Standards of Reporting Trials
  - D Consolidated Scheme of Reporting Trials
- 45 A co-efficient close to -1 indicates
- A A strong correlation
  - B A weak correlation
  - C Either of the above
  - D None of the above
- 46 The correlation coefficient ( $r = 0.8$ ) of fasting blood sugar and fatigue is statistically significant ( $p < 0.01$ ). It indicates
- A 80% ( $0.8 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - B 64% ( $0.8^2 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - C 20% ( $100 - 80$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - D 36% ( $100 - 0.8^2 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
- 47 A study investigator wishes to use a sampling technique wherein the population is divided into homogenous subgroups for taking samples from each subgroup. Which sampling technique should he use?
- A Simple sampling
  - B Cluster sampling
  - C Stratified sampling
  - D Systematic sampling

- 48 A study investigator wishes to use a sampling technique for an epidemiological study wherein he wishes to randomly pick specific geographic units for the study. Which sampling technique should he use?
- A Simple sampling
  - B Cluster sampling
  - C Stratified sampling
  - D Systematic sampling
- 49 Which of the following does a basic box and whisker plot not depict?
- A Median
  - B First quartile
  - C Mean
  - D Upper extreme
- 50 Which of the following is correctly arranged in descending order of size?
- A Population > Accessible Population > Target Population > Sample
  - B Population > Target Population > Accessible Population > Sample
  - C Population = Accessible Population > Target Population > Sample
  - D Population = Target Population > Accessible Population > Sample

## PART-B – Dentistry

51. Least cariogenous among these
- cooked starch
  - sucrose
  - Raw starch
  - fructose
- 52) Chairside CAD/ CAM restoration require
- Optical impression
  - Dual impression
  - pindex impression
  - Elastomeric impression
- 53) First indication of tooth formation occurs as early as
- Twelve weeks of prenatal life
  - eight weeks of prenatal life
  - Three months of postnatal life
  - six weeks of prenatal life
- 54) Chronic periostitis in children are known as
- histiocytosis
  - Garre's osteomyelitis
  - Tubercular osteomyelitis
  - cherubism
- 55) Green span lesion is
- Hairy leukoplakia
  - Lichen planus
  - Geographic tongue
  - Oral submucous fibrosis
- 56) Vertical compaction of warm gutta percha technique was given by
- Grossman
  - Ingle
  - Schilder
  - Cohen
- 57) Perel pontic is known as
- Fish belly pontic
  - conical pontic
  - modified sanitary pontic
  - ovate pontic
- 58) Nalgonda technique of defluoridation was developed at
- Nalgonda
  - Bangalore
  - Nagpur
  - Chennai
- 59) The central cells in granular cell ameloblastoma shows cytoplasmic granules are aggregates of
- mitochondria
  - glycogen
  - ribosome
  - lysosomes
- 60) Constant feature associated with a radicular cyst is
- non vital tooth
  - an impacted tooth
  - healthy tooth
  - a missing tooth
- 61) Katz classification of malocclusion is based on
- Deciduous to molar relationship
  - premolars relationship
  - incisor relationship
  - molar relationship
- 62) The chemical used to etch enamel is
- phosphoric acid
  - methyl methacrylate
  - eugenol
  - zinc oxide
- 63) Pathergy test is done for
- Bechet's disease
  - Magic syndrome



- c) Mikulicz's disease  
d) Sattonis disease
- 64) "NO TABACCO DAY" is celebrated every year by world on  
a) 31st May  
b) 5th December  
c) 1st August  
d) 7th April
- 65) Most common tumour associated with AIDS  
a) Melanoma  
b) Kaposi sarcoma  
c) Ewing sarcoma  
d) Carcinoma
- 66) The term audio-analgesia is also known as  
a) Hand over mouth exercise  
b) voice control  
c) white noise  
d) hypnosis
- 67) Bone loss pattern is most of the cases of infrabony pocket  
a) oblique  
b) vertical  
c) irregular  
d) horizontal
- 68) Which of the following is known as "Gum Strippers"  
a) acrylic partial dentures  
b) removable partial denture  
c) gingival cord  
d) copper band
- 69) Impression material of choice for child with oro-nasal defect is  
a) polyether and heavy body silicone  
b) alginate  
c) repositil or polyvinyl siloxane  
d) wash impression or zinc oxide eugenol impression paste
- 70) Agar is prepared from  
a) chemicals  
b) bullock heart  
c) chick cells  
d) seaweeds
- 71) 'Gracy currettes' number 15-16 is modification of the standard number  
a) 9-10  
b) 13-14  
c) 17-18  
d) 11-12
- 72) Avulsed tooth should be stabilized by  
a) orthodontic wire  
b) stainless steel wire  
c) splinting  
d) porcelain jacket crown
- 73) Function of Merkel's cell  
a) chemoreceptor  
b) melanophage  
c) proprioceptor  
d) tactile sensation
- 74) Which of the following indices is used to assess the severity of periodontitis in epidemiological studies of large population?  
a) periodontal index  
b) gingival index  
c) sulcus bleeding index  
d) PMA index
- 75) Ameloblastoma most frequently occurs in  
a) mandibular anterior teeth region  
b) maxillary molar region  
c) maxillary canine region  
d) mandibular molars region

76) Which of the following type of non-hodgkin's lymphoma is common in oral cavity?

- a) natural killer cells
- b) B-cell
- c) histocystic monocytic cells
- d) T cells

77) Drumstick is found in

- a) monocytes
- b) lymphocytes
- c) platelets
- d) neutrophils

78) Which of the following is considered as passive components of fixed orthodontic appliance

- a) Temporary anchorage device
- b) W arch wire
- c) Elastic separator
- d) NiTi coil springs

79) Mottled enamel is due to

- a) hypercalcification of enamel
- b) high fluoride content in water
- c) calcification of dental pulp
- d) low fluoride content

80) Treatment for non-vital young permanent tooth with incompletely formed root is

- a) pulpotomy
- b) apexification
- c) mummification
- d) apexogenesis

81) What is pH of calcium hydroxide?

- a) 13
- b) 7
- c) 5
- d) 3

82) Pink spot is a sign of

- a) internal resorption
- b) necrotic pulp tissue
- c) crowning of teeth
- d) internal bleeding

83) Darling disease is

- a) phycomycosis
- b) actinomycosis
- c) bleomycosis
- d) histoplasmosis

84) Making the child observe when a dentist is working on a co-operative child is an example of

- a) modeling
- b) reinforcement
- c) desensitization
- d) association

85) In which of the following conditions 'Antischnow cell' can be seen

- a) sickle cell anemia
- b) iron deficiency anemia
- c) recurrent aphthous ulcer
- d) ulcer of the ulcer

86) Which of the following produces least pigmentation of the teeth

- a) chlortetracycline
- b) oxytetracycline
- c) doxycycline
- d) tetracycline

87) Presence of Herberden's nodes (swelling of terminal finger joints) is the most characteristic of

- a) albright's syndrome
- b) fibrous dysplasia
- c) osteoarthritis
- d) rheumatoid arthritis

- 88) Which of the following local anesthetic safely indicated in children
- 2-chlorprocaine
  - prilocane
  - cocaine
  - procaine
- 89) Most effective way to combat disease in a community
- community water fluoridation
  - regular prophylaxis topical fluoride
  - regular dental checkup and water fluoridation
  - control diet eliminating all sugars
- 90) Dilaceration refers to
- curvature of root tip
  - cemento enamel junction
  - calcified root canal
  - dysplasia of dentin
- 91) Hairy tongue is characterized by hypertrophy of which of the following papilla
- foliate
  - filiform
  - fungiform
  - circumvallate
- 92) A focal dilation of veins or group of venules is known as
- varix
  - angioma
  - petechia
  - ecchymosis
- 93) Rushton bodies are present in
- odontogenic keratocyst
  - periodontal cyst
  - periapical cyst
  - primordial cyst
- 94) Blue sclera is present in
- Marfan's syndrome
  - cherubism
  - osteogenesis imperfecta
  - all of the above
- 95) Monospot test is used in the diagnosis of
- leukaemia
  - infectious mononucleosis
  - candidiasis
  - herpes zoster
- 96) Tzanc cell are characteristics feature of
- pemphigus
  - lichen planus
  - leukemia
  - psoriasis
- 97) The function of the facial nerve is best tested by
- swallowing
  - whistling
  - protruding of tongue
  - moving the mandible side to side
- 98) Gustatory sweating is seen in which of the following disease
- Bell's palsy
  - Frey's syndrome
  - Menier's syndrome
  - tic douloureux
- 99) The x-ray view which is the best maxillary sinus
- Water's view
  - Towne's view
  - Submentovertex
  - lateral oblique view
- 100) Anchorage in a removable appliance is provided by
- labial bow
  - finger spring
  - clasp
  - acrylic plates

**Answer Key:**

<b>Part – A Research Methodology</b>					<b>Part – B Dentistry</b>				
<b>1</b>	<b>B</b>		<b>26</b>	<b>B</b>	<b>51</b>	<b>D</b>		<b>76</b>	<b>B</b>
<b>2</b>	<b>B</b>		<b>27</b>	<b>B</b>	<b>52</b>	<b>A</b>		<b>77</b>	<b>D</b>
<b>3</b>	<b>C</b>		<b>28</b>	<b>C</b>	<b>53</b>	<b>D</b>		<b>78</b>	<b>A</b>
<b>4</b>	<b>B</b>		<b>29</b>	<b>A</b>	<b>54</b>	<b>B</b>		<b>79</b>	<b>B</b>
<b>5</b>	<b>A</b>		<b>30</b>	<b>C</b>	<b>55</b>	<b>B</b>		<b>80</b>	<b>B</b>
<b>6</b>	<b>A</b>		<b>31</b>	<b>C</b>	<b>56</b>	<b>C</b>		<b>81</b>	<b>A</b>
<b>7</b>	<b>A</b>		<b>32</b>	<b>A</b>	<b>57</b>	<b>C</b>		<b>82</b>	<b>A</b>
<b>8</b>	<b>D</b>		<b>33</b>	<b>C</b>	<b>58</b>	<b>C</b>		<b>83</b>	<b>D</b>
<b>9</b>	<b>A</b>		<b>34</b>	<b>C</b>	<b>59</b>	<b>D</b>		<b>84</b>	<b>A</b>
<b>10</b>	<b>D</b>		<b>35</b>	<b>D</b>	<b>60</b>	<b>A</b>		<b>85</b>	<b>D</b>
<b>11</b>	<b>A</b>		<b>36</b>	<b>C</b>	<b>61</b>	<b>B</b>		<b>86</b>	<b>C</b>
<b>12</b>	<b>A</b>		<b>37</b>	<b>B</b>	<b>62</b>	<b>A</b>		<b>87</b>	<b>C</b>
<b>13</b>	<b>C</b>		<b>38</b>	<b>C</b>	<b>63</b>	<b>A</b>		<b>88</b>	<b>A</b>
<b>14</b>	<b>A</b>		<b>39</b>	<b>B</b>	<b>64</b>	<b>A</b>		<b>89</b>	<b>C</b>
<b>15</b>	<b>B</b>		<b>40</b>	<b>C</b>	<b>65</b>	<b>B</b>		<b>90</b>	<b>A</b>
<b>16</b>	<b>C</b>		<b>41</b>	<b>C</b>	<b>66</b>	<b>C</b>		<b>91</b>	<b>B</b>
<b>17</b>	<b>C</b>		<b>42</b>	<b>B</b>	<b>67</b>	<b>B</b>		<b>92</b>	<b>A</b>
<b>18</b>	<b>B</b>		<b>43</b>	<b>B</b>	<b>68</b>	<b>A</b>		<b>93</b>	<b>C</b>
<b>19</b>	<b>C</b>		<b>44</b>	<b>A</b>	<b>69</b>	<b>C</b>		<b>94</b>	<b>D</b>
<b>20</b>	<b>A</b>		<b>45</b>	<b>A</b>	<b>70</b>	<b>D</b>		<b>95</b>	<b>B</b>
<b>21</b>	<b>D</b>		<b>46</b>	<b>A</b>	<b>71</b>	<b>D</b>		<b>96</b>	<b>A</b>
<b>22</b>	<b>D</b>		<b>47</b>	<b>C</b>	<b>72</b>	<b>C</b>		<b>97</b>	<b>B</b>
<b>23</b>	<b>C</b>		<b>48</b>	<b>B</b>	<b>73</b>	<b>D</b>		<b>98</b>	<b>B</b>
<b>24</b>	<b>C</b>		<b>49</b>	<b>C</b>	<b>74</b>	<b>A</b>		<b>99</b>	<b>A</b>
<b>25</b>	<b>A</b>		<b>50</b>	<b>B</b>	<b>75</b>	<b>D</b>		<b>100</b>	<b>D</b>

**This Booklet Contains twelve pages  
PhD Entrance Test [2023]  
Rajendra Institute of Medical Sciences, Ranchi**

Roll No: .....

Name: .....

Answer Sheet Number. ....

Signature and Name of Invigilator .....

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

Time: 2 hours

**Maximum Marks: 100**

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Please Read this instruction 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.

## **PART-A -Research Methodology**

1. Which of the following is true for randomised controlled trials in comparison to observational studies?  
A Greater internal and external validity  
B Greater internal validity but lower external validity  
C Lower internal validity but greater external validity  
D Lower internal and external validity
2. In a case control study, the investigator is collecting data from cases at bedside and from matched controls via call. This can lead to.  
A Selection bias  
B Information bias  
C Confounding  
D Chance
3. How to analyse qualitative data?  
A Independent t-test  
B Dependent t-test  
C Chi-square  
D Wilcoxon sign-rank test
4. What will be the sample size in cross-over study design?  
A Double of parallel design  
B Half of parallel design  
C Equal of parallel design  
D None of the above
5. What is odds ratio?  
A Odds of event in one group divided by odds of event in the other group  
B Odds of event in one group minus odds of event in the other group  
C Odds of event in one group multiplied by risk of event in the other group  
D Odds of event in one group plus odds of event in the other group
6. Which of the following is NOT an observational study?  
A Phase-1 trial  
B Case series  
C Case control study  
D Cohort study
7. Power of a study is?  
A 1 - type 2 error

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C 1 - type 1 error  
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A The probability of both of two mutually exclusive events occurring is derived by multiplication  
B The probability of both of two mutually exclusive events occurring is derived by addition  
C The probability of both of two mutually exclusive events occurring is derived by subtraction  
D None of the above
- 27 Which of the following statements is FALSE?  
A If repeated measurements of a characteristic in the same individual under identical conditions produce similar results, we would say that the measurement is reliable.  
B If the measurement has high reliability, the standard deviation should be larger.  
C A result is said to be reliable if the same result is obtained when the study is repeated under the same conditions  
D The natural variability in observations among individuals in the population is commonly known as random error.
- 28 When there are even number of observations, median is?  
A The lower of the middle value  
B The higher of the middle value  
C Average of the two middle values  
D The arithmetic average
- 29 Which of the following is most affected by outliers?  
A Mean  
B Median  
C Mode  
D None of the above
- 30 Which of the following statements is FALSE?  
A A measurement is said to be valid if it measures what it is supposed to.  
B If a measurement is not valid, we say it is 'biased'.  
C Bias is a random error that skews the observation to either side of the truth.  
D If we use a scale that is not calibrated to zero, it hampers the validity of the study.
- 31 Which of the following is not a measure of position?  
A Quantile  
B Z score  
C Standard deviation  
D Centile
- 32 Individuals who have worked but do not match the authorship criteria should be?  
A Acknowledged in the manuscript  
B Given the option for gift authorship  
C Not to mention in the manuscript  
D Any of the above, depending on the corresponding author
- 33 Authors who have used artificial intelligence (AI)-assisted technologies in the production of submitted work can do which of the following?  
A Add AI as a co-author  
B Cite AI as their source of work  
C Both of the above  
D None of the above
- 34 Which of the following is a potential source for conflict of interest?  
A Professional judgment concerning the validity of research may be influenced by financial gain  
B Professional judgment concerning patients' welfare may be influenced by financial gain  
C Both of the above  
D None of the above

- 35 Which of the following is FALSE for experimental studies (compared to observational studies)?
- A The ability to manipulate or assign independent variables.
  - B The ability to randomize subjects to experimental and control groups.
  - C The ability to control confounding and eliminate sources of spurious association.
  - D Generally, samples are more representative of the population
- 36 Which of the following is not a systematic error?
- A Selection bias
  - B Information bias
  - C Chance
  - D Confounding
- 37 Which of the following denote causal association?
- A Observation bias in association
  - B Consistency of association
  - C Chance in association
  - D Sensitivity of the association
- 38 Relative risk cannot be calculated for which of the following study designs?
- A Phase 3 trial
  - B Cohort study
  - C Cross-sectional study
  - D Phase 4 trial
- 39 How many subjects are expected to lie in the third quartile of a sample?
- A 10%
  - B 25%
  - C 50%
  - D 90%
- 40 Rejection of null hypothesis leads to acceptance of?
- A Alternate hypothesis
  - B Experimental hypothesis
  - C Either of the above
  - D None of the above
- 41 When we deduce that the observed effect is only due to chance, we
- A Accept the alternate hypothesis
  - B Reject the null hypothesis
  - C Fail to reject the null hypothesis
  - D Accept both the null and alternate hypothesis
- 42 What is the conventional value of type 1 error?
- A 1%
  - B 5%
  - C 10%
  - D 80%
- 43 If the p-value threshold for significance is considered at 0.05, and the obtained p-value is 0.03, we
- A Accept the null hypothesis
  - B Reject the null hypothesis
  - C Fail to reject the null hypothesis
  - D Reject the alternate hypothesis
- 44 What is CONSORT?
- A Consolidated Standards of Reporting Trials
  - B Consensus Statement of Reporting Trials
  - C Clear Standards of Reporting Trials
  - D Consolidated Scheme of Reporting Trials
- 45 A co-efficient close to -1 indicates
- A A strong correlation
  - B A weak correlation
  - C Either of the above
  - D None of the above
- 46 The correlation coefficient ( $r = 0.8$ ) of fasting blood sugar and fatigue is statistically significant ( $p < 0.01$ ). It indicates
- A 80% ( $0.8 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - B 64% ( $0.8^2 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - C 20% ( $100 - 80$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - D 36% ( $100 - 0.8^2 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
- 47 A study investigator wishes to use a sampling technique wherein the population is divided into homogenous subgroups for taking samples from each subgroup. Which sampling technique should he use?
- A Simple sampling
  - B Cluster sampling
  - C Stratified sampling
  - D Systematic sampling
- 48 A study investigator wishes to use a sampling technique for an epidemiological study wherein he wishes to randomly pick specific



geographic units for the study. Which sampling technique should he use?

- A Simple sampling
- B Cluster sampling
- C Stratified sampling
- D Systematic sampling

49 Which of the following does a basic box and whisker plot not depict?

- A Median
- B First quartile
- C Mean
- D Upper extreme

50 Which of the following is correctly arranged in descending order of size?

- A Population > Accessible Population > Target Population > Sample
- B Population > Target Population > Accessible Population > Sample
- C Population = Accessible Population > Target Population > Sample
- D Population = Target Population > Accessible Population > Sample

## PART-B - MEDICAL

S. No.	Question	Choice
51.	A 6-day old infant is being examined. While checking the reflexes, a brisk Moro's reflex is noted. Which of the following conditions is a likely cause for this?	<ul style="list-style-type: none"> <li>A. Kernicterus</li> <li>B. Stage III hypoxic ischemic encephalopathy (HIE)</li> <li>C. Hypoglycemia</li> <li>D. Erb's palsy</li> </ul>
52.	Which of the following statements about abnormal hemoglobins and their mechanisms is true?	<ul style="list-style-type: none"> <li>A. HbS is due to substitution of lysine for glutamine in the 6th position of the beta-globin gene.</li> <li>B. HbH is the deletion of three alpha-globin genes.</li> <li>C. Hb Bart is the deletion of all four beta-globin genes.</li> <li>D. HbC is due to substitution of valine for lysine in the 6th position of the beta-globin gene.</li> </ul>
53.	A full-term neonate was found to have distention of the abdomen. He also passed his meconium late and based on further workup was later diagnosed with Hirschsprung disease. Which of the following conditions is least likely to be found in association with this?	<ul style="list-style-type: none"> <li>A. Von Recklinghausen's disease</li> <li>B. Joubert syndrome</li> <li>C. Edward syndrome</li> <li>D. Down's syndrome</li> </ul>
54.	Which of the following fits into the criteria of severe variable deceleration, variations less than:	<ul style="list-style-type: none"> <li>A. 90 beats per minute lasting for 60 seconds</li> <li>B. 80 beats per minute lasting for 60 seconds</li> <li>C. 100 beats per minute lasting for 60 seconds</li> <li>D. 70 beats per minute lasting for 60 seconds</li> </ul>
55.	Bifidus factor present in breast milk protects against	<ul style="list-style-type: none"> <li>A. Enteroamoeba histolytica</li> <li>B. Giardia lamblia</li> <li>C. Salmonella</li> <li>D. Vibrio cholerae</li> </ul>
56.	What is the most likely cause of a mediastinal mass in a 2-year-old child?	<ul style="list-style-type: none"> <li>A. Neurogenic tumors</li> <li>B. Thymoma</li> <li>C. Germ cell tumors</li> <li>D. Lymphoma</li> </ul>
57.	Which of the following statements is true regarding iron?	<ul style="list-style-type: none"> <li>A. Breast milk has higher iron content than cow's milk.</li> <li>B. Cow's milk has higher oral bio-availability of iron than breast milk.</li> <li>C. Introduction of cow's milk at 5 months of age decreases the risk of iron deficiency.</li> <li>D. Cow's milk protein can cause chronic intestinal blood loss in infants.</li> </ul>
58.	Which of the following statements is true?	<ul style="list-style-type: none"> <li>A. Head reaches 90% of adult size at 1 year</li> <li>B. Lymphoid growth follows a sigmoid-shaped pattern</li> <li>C. Perinatal period is between 28 weeks of gestation to 7 days after birth</li> <li>D. Growth of child is cephalocaudal and distal to proximal</li> </ul>

59.	Which of the following is true about Diamond Blackfan Anemia?	<p>A. Short stature, craniofacial abnormalities, and triphalangeal thumb are common features</p> <p>B. Peripheral smear shows microcytic hypochromic anemia.</p> <p>C. Bone marrow failure includes erythroid, myeloid and megakaryocytic lineages.</p> <p>D. Reticulocyte count is increased.</p>
60.	A neonate is found to have increased irritability, poor feeding, and 2 episodes of seizures. Lumbar puncture was done and the findings were suggestive of meningitis. What is the most likely causative organism?	<p>A. Streptococcus agalactiae</p> <p>B. Escherichia coli</p> <p>C. Neisseria meningitidis</p> <p>D. Listeria monocytogenes</p>
61.	Which of the following is false about apnea of prematurity (AOP)?	<p>A. Usually resolves by 37 weeks post conceptional age</p> <p>B. Gentle tactile stimulation is often adequate for mild to moderate episodes</p> <p>C. Recurrent AOP can be treated with caffeine or theophylline</p> <p>D. AOP is a risk factor for Sudden infant death syndrome (SIDS)</p>
62.	An 11-year-old child was brought to the hospital by his mother with complaints of multiple episodes of passing blood in the urine. Which of the following condition is not associated with this symptom?	<p>A. Berger's disease</p> <p>B. Hemolytic uremic syndrome</p> <p>C. Hereditary nephritis</p> <p>D. Idiopathic hypercalciuria</p>
63.	Which of the following is an example of disability limitation for polio?	<p>A. Polio immunization drives for infants to reduce the occurrence.</p> <p>B. Arranging for schooling for a child suffering from residual polio paralysis.</p> <p>C. Resting the affected limbs due to polio in neutral position.</p> <p>D. Providing calipers for walking to patients affected by polio.</p>
64.	All the following cause widening of confidence interval except?	<p>A. Increase in sample size</p> <p>B. Decrease in sample size</p> <p>C. Increase in variability</p> <p>D. Increase in confidence level</p>
65.	A physician follows the two test protocol for the diagnosis of HIV in a patient. It consists of:	<p>A. Western blot as the first test</p> <p>B. Indirect immunofluorescence assay as the second test</p> <p>C. HIV ELISA as the second test</p> <p>D. Western blot test as the second</p>
66.	As per the verbal autopsy report 2010-2013, arrange the most common cause of death among 1-4-year-old children in descending order.	<p>1. Diarrhea</p> <p>2. Pneumonia</p> <p>3. Malaria</p> <p>4. Injuries</p> <p>A. 2&gt;1&gt;3&gt;4</p> <p>B. 4&gt;1&gt;2&gt;3</p> <p>C. 1=&gt;2&gt;4&gt;3</p> <p>D. 2&gt;1&gt;4&gt;3</p>

67.	Which of the following is not used in the assessment of body fat?	<ul style="list-style-type: none"> <li>A. Quetelet's index</li> <li>B. Total body potassium</li> <li>C. Total body water</li> <li>D. Breslow index</li> </ul>
68.	As per the new National Policy for Rare Diseases, financial support of up to Rs. 20 lakhs can be given to which group of rare diseases?	<ul style="list-style-type: none"> <li>A. Group 1</li> <li>B. Group 2</li> <li>C. Group 3</li> <li>D. Group 4</li> </ul>
69.	Which of the following duties would be performed by a male health worker?	<ul style="list-style-type: none"> <li>1. Chlorination of water bodies</li> <li>2. Maintenance of eligible couple registers</li> <li>3. Distribution of conventional contraceptives</li> <li>4. Universal Immunization Program</li> <li>5. Reproductive and child health services</li> </ul> <ul style="list-style-type: none"> <li>A. 2,4</li> <li>B. 1,3,4</li> <li>C. 1,3,5</li> <li>D. 2,5</li> </ul>
70.	Which of the following comes under the Rashtriya Varishth Jan Swasthya Yojana?	<ul style="list-style-type: none"> <li>A. Domiciliary visits to homes of elderly in the community by ANMs or male HCWs</li> <li>B. Rehabilitation units with physiotherapy at CHCs</li> <li>C. Super-specialty geriatric departments for training, guidelines and referral</li> <li>D. Weekly geriatric clinics arranged at PHCs by medical officer</li> </ul>
71.	In a town with a population of 1,00,000, a total of 50,000 slides were examined for malaria. Among these, 100 cases of malaria were confirmed. What is the annual parasite incidence of this town?	<ul style="list-style-type: none"> <li>A. 0.1</li> <li>B. 0.5</li> <li>C. 1</li> <li>D. 2</li> </ul>
72.	The evaluation based on the treatment given to the patient and their clinical management in a health care facility measures which of the following?	<ul style="list-style-type: none"> <li>A. Outcome</li> <li>B. Process</li> <li>C. Structure</li> <li>D. Input</li> </ul>
73.	Which of the following side effects is most likely to develop in a newborn, following BCG vaccination?	<ul style="list-style-type: none"> <li>A. Ulceration</li> <li>B. Fever</li> <li>C. Regional lymphadenitis</li> <li>D. Suppurative lymphadenopathy</li> </ul>
74.	Vitamin A deficiency is considered a public health problem if the prevalence of corneal xerosis among children aged 6 months - 6 years is more than:	<ul style="list-style-type: none"> <li>A. 5%</li> <li>B. 1%</li> <li>C. 0.5%</li> <li>D. 0.01%</li> </ul>

75.	In a subcentre area with a crude birth rate (CBR) of 20, what would be the expected number of antenatal care (ANC) registrations by the village health nurse (VHN) in a year?	A. 60 B. 80 C. 100 D. 110
76.	Which of the following statements is false about ICD- 11?	A. It includes a new chapter on traditional medicine B. Gender incongruence is now listed as part of mental health C. The codes relating to antimicrobial resistance are more closely in line with the Global Antimicrobial Resistance Surveillance System D. It has come into full effect from January 2022
77.	The WHO defines disabling hearing loss in adults as a hearing loss of more than:	A. 60 dB B. 50 dB C. 40 dB D. 30 dB
78.	A young girl who is 7 month pregnant is concerned about a chest X-ray that she had taken 3 weeks back. What Is the dose of radiation below which deterministic effects on the fetus are not seen?	A. 0.5 mSv B. 2 mSv C. 3 RAD D. 5 RAD
79.	A nurse in a PHC is using bleaching powder to disinfect bed linen contaminated with stool. What is the amount that she should use?	A. 50 Q/L B. 75 g/L C. 90Q/L D. 100 g/L
80.	A study is being conducted on anaemia in pregnancy. A normal distribution curve with a mean haemoglobin level of 10.6 gm/dL with a standard deviation of 2 gm/dL is obtained. Below what level would 5% of the women in the group have their haemoglobin values?	A. 8.6 g/dL B. 7.31 g/dL C. 6.6 g/dL D. 5.0 g/dL
81.	Among the given options, what can be the likely value of the coefficient of correlation between infant mortality rate and economic status?	A. +1 B. -1 C. +0.22 D. -0.8
82.	Which of the following criteria should be satisfied to start MDT?	1. Hypopigmented patch with sensory loss 2. Peripheral nerve thickening 3. Peripheral nerve thickening with sensory loss 4. Skin biopsy demonstrating bacilli  A. 1,4 B. 1,3 C. 1,3,4 D. 1,2,3,4

83.	Which of the following statements is false about the DPT vaccine?	<ul style="list-style-type: none"> <li>A. Adult preparation contains a lower dose of diphtheria than the pediatric version</li> <li>B. Whole killed bacteria of Bordetella pertussis has an adjuvant effect</li> <li>C. The whole-cell killed B. pertussis component is encephalogenic</li> <li>D. Presence of H. influenzae type b component increases its immunogenicity</li> </ul>
84.	A 32-year-old man is diagnosed with syphilis. On probing, he gives you the information of other people in the same sociosexual environment as him. You then refer all these people for testing. What is this method of case detection?	<ul style="list-style-type: none"> <li>A. Contact testing</li> <li>B. High-risk screening</li> <li>C. Selective screening</li> <li>D. Cluster testing</li> </ul>
85.	According to the WHO Labour Care Guidelines, documentation of labour progress begins at a cervical dilatation of -	<ul style="list-style-type: none"> <li>A. 3cm</li> <li>B. 4cm</li> <li>C. 6cm</li> <li>D. 5cm</li> </ul>
86.	Which of the following is seen in congenital elongation of the cervix?	<ul style="list-style-type: none"> <li>A. The vaginal portion of the cervix gets elongated</li> <li>B. The supravaginal portion of the cervix gets elongated</li> <li>C. Both the vaginal and supravaginal portions of the cervix get elongated</li> <li>D. There is no true elongation and it is a misnomer</li> </ul>
87.	What is the most common cause of male infertility?	<ul style="list-style-type: none"> <li>A. Disorders of spermatogenesis</li> <li>B. Obstruction of the efferent ducts</li> <li>C. Disorders of sperm motility</li> <li>D. Erectile dysfunction</li> </ul>
88.	A woman with unilateral renal agenesis presents to your clinic with a history of recurrent abortions. You suspect uterine didelphys. Which of the following investigations would you perform on her?	<ul style="list-style-type: none"> <li>A. Laparoscopy</li> <li>B. Intravenous pyelography</li> <li>C. Hysterosalpingography</li> <li>D. Ultrasonography</li> </ul>
89.	Which of the following is not an advantage of norgestimate OCPs?	<ul style="list-style-type: none"> <li>A. Reduces venous thrombosis</li> <li>B. Less metabolic side effects</li> <li>C. Reduces acne and hirsutism</li> <li>D. Lesser cardiovascular risk</li> </ul>
90.	What is the duration of the 4th trimester in pregnancy?	<ul style="list-style-type: none"> <li>A. 6 weeks postpartum</li> <li>B. 12 weeks postpartum</li> <li>C. 4 weeks postpartum</li> <li>D. 38 to 40 weeks of pregnancy</li> </ul>
91.	A lady presents with abdominal pain. USG reveals multiple gall stones with no wall thickening. CBD diameter is 12 mm and serum bilirubin was 0.8. Alkaline phosphatase is 380 and GGT is raised by 5 times. What is the next best step of management?	<ul style="list-style-type: none"> <li>A. MRCP</li> <li>B. ERCP</li> <li>C. Endoscopic ultrasound</li> <li>D. Laparoscopic cholecystectomy</li> </ul>

92.	A young male patient presents with a discrete thyroid swelling. USG reveals an isolated cystic swelling of the gland. Which of the following statements correctly expresses the risk of malignancy in this patient?	A. 6% B. 12% C. 24% D. 48%
93.	Which of the following cancers are correctly matched with the criteria for the minimum number of lymph nodes required for pathological staging?	1. CA stomach – 10 2. CA colon- 12 3. CA gall bladder – 6 4. CA breast -15  A. B,C B. A,B,C C. A,C,D D. A,B,C,D
94.	A 75-year-old lady with type 2 diabetes mellitus, hypertension, and end-stage renal disease on hemodialysis presents with hypercalcemia, hyperphosphatemia, and elevated PTH. What is the treatment of choice in this condition?	A. Total parathyroidectomy without autotransplantation B. Subtotal parathyroidectomy C. Minimally invasive focussed parathyroidectomy D. Medical management with cinacalcet
95.	Which of the following is the most common Gastrointestinal atresia?	A. Duodenal atresia B. Colonic atresia C. Ileal atresia D. Jejunal atresia
96.	A 50-year-old patient is diagnosed with deep vein thrombosis in his right limb. Which of the following parameters is a part of Well's criteria that assess the clinical likelihood of pulmonary embolism in this patient?	A. Dyspnea B. Orthopnea C. Chest pain D. Hemoptysis
97.	Which of the following conditions is not a MELD exception?	A. Hepatopulmonary syndrome B. Portopulmonary hypertension C. Primary hyperoxaluria D. Chronic Hepatitis B
98.	Which of the following has been most commonly implicated as a cause of dialysis-induced hypotension in patients?	A. Bicarbonate B. Aluminium C. Acetate D. Phosphate
99.	Who comes under category III non-heart-beating donor?	A. A patient who died during transportation to the hospital B. A patient who died after failed resuscitation after reaching the hospital C. A patient who was brought dead to the hospital D. A patient who is awaiting death in the hospital
100.	A 20-year-old woman is being evaluated for adrenal insufficiency. You decide to check her serum levels of ACTH, renin, and aldosterone. Which of the following laboratory findings would prompt you to subsequently order a pituitary MRI?	A. High renin and low aldosterone levels High ACTH levels B. Low renin and high aldosterone levels C. Normal levels renin and aldosterone

**Answer Key**

<b>Part – A Research Methodology</b>					<b>Part – B Medical</b>					
<b>1</b>	<b>B</b>		<b>26</b>	<b>B</b>	<b>51</b>	<b>B</b>		<b>76</b>	<b>B</b>	
<b>2</b>	<b>B</b>		<b>27</b>	<b>B</b>	<b>52</b>	<b>B</b>		<b>77</b>	<b>C</b>	
<b>3</b>	<b>C</b>		<b>28</b>	<b>C</b>	<b>53</b>	<b>D</b>		<b>78</b>	<b>A</b>	
<b>4</b>	<b>B</b>		<b>29</b>	<b>A</b>	<b>54</b>	<b>D</b>		<b>79</b>	<b>B</b>	
<b>5</b>	<b>A</b>		<b>30</b>	<b>C</b>	<b>55</b>	<b>C</b>		<b>80</b>	<b>C</b>	
<b>6</b>	<b>A</b>		<b>31</b>	<b>C</b>	<b>56</b>	<b>D</b>		<b>81</b>	<b>D</b>	
<b>7</b>	<b>A</b>		<b>32</b>	<b>A</b>	<b>57</b>	<b>D</b>		<b>82</b>	<b>C</b>	
<b>8</b>	<b>D</b>		<b>33</b>	<b>C</b>	<b>58</b>	<b>D</b>		<b>83</b>	<b>C</b>	
<b>9</b>	<b>A</b>		<b>34</b>	<b>C</b>	<b>59</b>	<b>A</b>		<b>84</b>	<b>A</b>	
<b>10</b>	<b>D</b>		<b>35</b>	<b>D</b>	<b>60</b>	<b>C</b>		<b>85</b>	<b>D</b>	
<b>11</b>	<b>A</b>		<b>36</b>	<b>C</b>	<b>61</b>	<b>D</b>		<b>86</b>	<b>B</b>	
<b>12</b>	<b>A</b>		<b>37</b>	<b>B</b>	<b>62</b>	<b>A</b>		<b>87</b>	<b>A</b>	
<b>13</b>	<b>C</b>		<b>38</b>	<b>C</b>	<b>63</b>	<b>C</b>		<b>88</b>	<b>D</b>	
<b>14</b>	<b>A</b>		<b>39</b>	<b>B</b>	<b>64</b>	<b>A</b>		<b>89</b>	<b>A</b>	
<b>15</b>	<b>B</b>		<b>40</b>	<b>C</b>	<b>65</b>	<b>D</b>		<b>90</b>	<b>B</b>	
<b>16</b>	<b>C</b>		<b>41</b>	<b>C</b>	<b>66</b>	<b>B</b>		<b>91</b>	<b>D</b>	
<b>17</b>	<b>C</b>		<b>42</b>	<b>B</b>	<b>67</b>	<b>D</b>		<b>92</b>	<b>B</b>	
<b>18</b>	<b>B</b>		<b>43</b>	<b>B</b>	<b>68</b>	<b>A</b>		<b>93</b>	<b>D</b>	
<b>19</b>	<b>C</b>		<b>44</b>	<b>A</b>	<b>69</b>	<b>B</b>		<b>94</b>	<b>C</b>	
<b>20</b>	<b>A</b>		<b>45</b>	<b>A</b>	<b>70</b>	<b>D</b>		<b>95</b>	<b>D</b>	
<b>21</b>	<b>D</b>		<b>46</b>	<b>A</b>	<b>71</b>	<b>D</b>		<b>96</b>	<b>D</b>	
<b>22</b>	<b>D</b>		<b>47</b>	<b>C</b>	<b>72</b>	<b>A</b>		<b>97</b>	<b>A</b>	
<b>23</b>	<b>C</b>		<b>48</b>	<b>B</b>	<b>73</b>	<b>B</b>		<b>98</b>	<b>A</b>	
<b>24</b>	<b>C</b>		<b>49</b>	<b>C</b>	<b>74</b>	<b>D</b>		<b>99</b>	<b>D</b>	
<b>25</b>	<b>A</b>		<b>50</b>	<b>B</b>	<b>75</b>	<b>B</b>		<b>100</b>	<b>A</b>	



**This Booklet Contains ten pages  
PhD Entrance Test [2023]  
Rajendra Institute of Medical Sciences, Ranchi**

Roll No: .....

Name: .....

Candidate's Signature .....

Answer Sheet Number. ....

Signature and Name of Invigilator .....

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

Time: 2 hours

**Maximum Marks: 100**

Please Read this instruction 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.

## **PART-A -Research Methodology**

- 1 Which of the following is true for randomised controlled trials in comparison to observational studies?
  - A Greater internal and external validity
  - B Greater internal validity but lower external validity
  - C Lower internal validity but greater external validity
  - D Lower internal and external validity
- 2 In a case control study, the investigator is collecting data from cases at bedside and from matched controls via call. This can lead to.
  - A Selection bias
  - B Information bias
  - C Confounding
  - D Chance
- 3 How to analyse qualitative data?
  - A Independent t-test
  - B Dependent t-test
  - C Chi-square
  - D Wilcoxon sign-rank test
- 4 What will be the sample size in cross-over study design?
  - A Double of parallel design
  - B Half of parallel design
  - C Equal of parallel design
  - D None of the above
- 5 What is odds ratio?
  - A Odds of event in one group divided by odds of event in the other group
  - B Odds of event in one group minus odds of event in the other group
  - C Odds of event in one group multiplied by risk of event in the other group
  - D Odds of event in one group plus odds of event in the other group
- 6 Which of the following is NOT an observational study?
  - A Phase-1 trial
  - B Case series
  - C Case control study
  - D Cohort study

- 7 Power of a study is?  
A 1 - type 2 error  
B type 2 error  
C 1 - type 1 error  
D type 1 error
- 8 What is the level of significance?  
A 1 - type 2 error  
B type 2 error  
C 1 - type 1 error  
D type 1 error
- 9 In a clinical trial, registration with Clinical Trials Registry-India is mandatory before?  
A Enrolment of first participant in the study  
B Submission of protocol to institutional research board  
C Submission of protocol to departmental research committee  
D Before publication of manuscript
- 10 Which of the following is the correct statement  
A Sample size is a best guess by the investigator  
B Any sample size more than 50 is adequate  
C Large sample size is always good  
D None of the above
- 11 Which is not a non-parametric test?  
A Student's t-test  
B Mann Whitney test  
C Kruskal Wallis test  
D Wilcoxon sign-rank test
- 12 If you have to estimate the prevalence of a disease in the community, what is the type of research question?  
A Descriptive  
B Analytical  
C Experimental  
D None of the above
- 13 Which of the following is not an indexing agency?  
A MEDLINE  
B Scopus  
C Nature  
D Web of Science
- 14 Who operates PubMed?  
A National Library of Medicine  
B International Library of Medicine  
C World Health Organisation  
D None of the above
- 15 What is the expansion of IMRaD?  
A Introduction, Methods, Relevance, and Discussion  
B Introduction, Methods, Results, and Discussion  
C Introduction, Methods, Results, and Directions  
D Introduction, Methods, Relevance, and Drawbacks
- 16 What is not the component of a protocol?  
A Rationale of a study  
B Study methodology  
C Study conclusion  
D Informed consent form
- 17 Which is an analytical study design?  
A Cross-sectional  
B Case report  
C Cohort  
D Case series
- 18 Which of the following is true about case control?  
A You start the research from exposure and go towards the outcome  
B You start the research from outcome and go towards the exposure  
C You assess the exposure and outcome with respect to the same point of time  
D All the above are acceptable
- 19 Scatterplots are used to visualise  
A Quantitative data on one axis and qualitative data on another axis  
B Qualitative data on two axes  
C Quantitative data on two axes  
D All the above
- 20 Which of the following data types cannot be presented as median and interquartile range?  
A Nominal  
B Ordinal  
C Interval  
D Ratio

- 21 Which of the following is true about normally distributed data?  
A Left-skewed  
B Skewed on either side  
C Right-skewed  
D None of the above
- 22 Which of the following is NOT true about normally distributed data?  
A It has a bell-shaped curve.  
B It has a single mode.  
C Mean, median, and mode coincide  
D Standard deviation is always greater than mean
- 23 Which of the following is NOT a statistical test for normality?  
A Kolmogorov-Smirnov test  
B Shapiro-Wilk test  
C Student's t-test  
D D'Agostino-Pearson omnibus test
- 24 Which test is used for data with multiple groups?  
A Paired t-test  
B Pearson correlation  
C One-way ANOVA  
D Mann Whitney U test
- 25 Which of the following statement is TRUE?  
A The probability of both of two independent events occurring is derived by multiplication  
B The probability of both of two dependent events occurring is derived by multiplication  
C The probability of both of two independent events occurring is derived by addition  
D None of the above
- 26 Which of the following is true?  
A The probability of both of two mutually exclusive events occurring is derived by multiplication  
B The probability of both of two mutually exclusive events occurring is derived by addition  
C The probability of both of two mutually exclusive events occurring is derived by subtraction  
D None of the above
- 27 Which of the following statements is FALSE?  
A If repeated measurements of a characteristic in the same individual under identical conditions produce similar results, we would say that the measurement is reliable.  
B If the measurement has high reliability, the standard deviation should be larger.  
C A result is said to be reliable if the same result is obtained when the study is repeated under the same conditions  
D The natural variability in observations among individuals in the population is commonly known as random error.
- 28 When there are even number of observations, median is?  
A The lower of the middle value  
B The higher of the middle value  
C Average of the two middle values  
D The arithmetic average
- 29 Which of the following is most affected by outliers?  
A Mean  
B Median  
C Mode  
D None of the above
- 30 Which of the following statements is FALSE?  
A A measurement is said to be valid if it measures what it is supposed to.  
B If a measurement is not valid, we say it is 'biased'.  
C Bias is a random error that skews the observation to either side of the truth.  
D If we use a scale that is not calibrated to zero, it hampers the validity of the study.
- 31 Which of the following is not a measure of position?  
A Quantile  
B Z score  
C Standard deviation  
D Centile
- 32 Individuals who have worked but do not match the authorship criteria should be?  
A Acknowledged in the manuscript  
B Given the option for gift authorship

- C Not to mention in the manuscript  
D Any of the above, depending on the corresponding author
- 33 Authors who have used artificial intelligence (AI)-assisted technologies in the production of submitted work can do which of the following?  
A Add AI as a co-author  
B Cite AI as their source of work  
C Both of the above  
D None of the above
- 34 Which of the following is a potential source for conflict of interest?  
A Professional judgment concerning the validity of research may be influenced by financial gain  
B Professional judgment concerning patients' welfare may be influenced by financial gain  
C Both of the above  
D None of the above
- 35 Which of the following is FALSE for experimental studies (compared to observational studies)?  
A The ability to manipulate or assign independent variables.  
B The ability to randomize subjects to experimental and control groups.  
C The ability to control confounding and eliminate sources of spurious association.  
D Generally, samples are more representative of the population
- 36 Which of the following is not a systematic error?  
A Selection bias  
B Information bias  
C Chance  
D Confounding
- 37 Which of the following denote causal association?  
A Observation bias in association  
B Consistency of association  
C Chance in association  
D Sensitivity of the association
- 38 Relative risk cannot be calculated for which of the following study designs?  
A Phase 3 trial  
B Cohort study  
C Cross-sectional study  
D Phase 4 trial
- 39 How many subjects are expected to lie in the third quartile of a sample?  
A 10%  
B 25%  
C 50%  
D 90%
- 40 Rejection of null hypothesis leads to acceptance of?  
A Alternate hypothesis  
B Experimental hypothesis  
C Either of the above  
D None of the above
- 41 When we deduce that the observed effect is only due to chance, we  
A Accept the alternate hypothesis  
B Reject the null hypothesis  
C Fail to reject the null hypothesis  
D Accept both the null and alternate hypothesis
- 42 What is the conventional value of type 1 error?  
A 1%  
B 5%  
C 10%  
D 80%
- 43 If the p-value threshold for significance is considered at 0.05, and the obtained p-value is 0.03, we  
A Accept the null hypothesis  
B Reject the null hypothesis  
C Fail to reject the null hypothesis  
D Reject the alternate hypothesis
- 44 What is CONSORT?  
A Consolidated Standards of Reporting Trials  
B Consensus Statement of Reporting Trials  
C Clear Standards of Reporting Trials  
D Consolidated Scheme of Reporting Trials

- 45 A co-efficient close to -1 indicates
- A A strong correlation
  - B A weak correlation
  - C Either of the above
  - D None of the above
- 46 The correlation coefficient ( $r = 0.8$ ) of fasting blood sugar and fatigue is statistically significant ( $p < 0.01$ ). It indicates
- A 80% ( $0.8 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - B 64% ( $0.8^2 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - C 20% ( $100 - 80$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
  - D 36% ( $100 - 0.8^2 \times 100$ ) of the variation in the fasting blood sugar is explained by fatigue and vice versa
- 47 A study investigator wishes to use a sampling technique wherein the population is divided into homogenous subgroups for taking samples from each subgroup. Which sampling technique should he use?
- A Simple sampling
  - B Cluster sampling
  - C Stratified sampling
  - D Systematic sampling
- 48 A study investigator wishes to use a sampling technique for an epidemiological study wherein he wishes to randomly pick specific geographic units for the study. Which sampling technique should he use?
- A Simple sampling
  - B Cluster sampling
  - C Stratified sampling
  - D Systematic sampling
- 49 Which of the following does a basic box and whisker plot not depict?
- A Median
  - B First quartile
  - C Mean
  - D Upper extreme
- 50 Which of the following is correctly arranged in descending order of size?
- A Population > Accessible Population > Target Population > Sample
  - B Population > Target Population > Accessible Population > Sample
  - C Population = Accessible Population > Target Population > Sample
  - D Population = Target Population > Accessible Population > Sample

## PART-B – PARA MEDICAL

- 51) Relative contraindication for postural drainage is
- A. Osteoporosis
  - B. Coagulopathy
  - C. Both of above
  - D. None of above
- 52) Chest manipulation that is relatively vigorous is
- A. Shaking
  - B. Vibration
  - C. Both of above
  - D. None of above
- 53) Padded electric tooth brush as a tool of chest manipulations is used for
- A. Pediatric patients
  - B. Adult patients
  - C. Female patients
  - D. Elderly patients
- 54) Physiotherapist can do the suctioning named
- A. Endotracheal suctioning
  - B. Oropharyngeal suctioning
  - C. Nasopharyngeal suctioning
  - D. All of above
- 55) Disadvantage of manual hyperinflation technique is it may not reduce hospital stay in
- A. Cardiac surgery patients
  - B. Brain injury patients
  - C. ICU patients
  - D. All of above
- 56) What does tinnitus mean?
- A. Ringing sensation
  - B. Dizziness
  - C. Spinning sensation
  - D. None of the above
- 57) Otosclerosis deafness happens due to -
- A. Viruses
  - B. Trauma
  - C. Overgrowth of ear ossicles
  - D. All of the above
- 58) Which hearing loss is due to obstruction?
- A. Sensorineural
  - B. Central
  - C. Conductive
  - D. Peripheral
- 59) Sensorineural hearing loss involves which cranial nerve ?
- A. 3rd
  - B. 7th
  - C. 8th
  - D. 6th
- 60) While measuring the wrist flexion, the movable arm should be \_\_\_\_\_?
- A. Aligned with third metacarpal.
  - B. Aligned with second metacarpal.
  - C. Aligned with first metacarpal.
  - D. Aligned with fifth metacarpal.
- 61) Flexor digitorum profundus can be tested with \_\_\_\_\_.
- A. flexion of wrist.
  - B. Flexion of index finger.
  - C. Flexion of DIP of finger.
  - D. Flexion of PIP of finger.
- 62) If the muscle can complete a full range of motion against the resistance of gravity, is called as
- A. Grade 1
  - B. Grade 2
  - C. Grade 3
  - D. Grade 4
- 63) Normal abduction range of motion of the shoulder is
- A. 0-90
  - B. 15-180
  - C. 10-180
  - D. 0-180

- 64) Sensory assessment determination of weight is referred to as
- A. Baragnosis
  - B. Stereognosis
  - C. two-point discrimination
  - D. Touch localization.
- 65) Arterial blood gas analysis for bicarbonate is
- A. 21-29 mmol/liter.
  - B. 29- 33 mmol/liter.
  - C. 33- 39 mmol/liter
  - D. 39- 44 mmol/liter.
- 66) The characteristic attitude of limbs in posterior dislocation of hip
- A. Flexion, adduction and internal rotation with significant shortening of limb
  - B. Flexion, abduction and external rotation with lengthening of limb
  - C. Flexion, abduction and external rotation with shortening of limb
  - D. None of these
- 67) All of the following are important functions of magnesium (Mg) except ?
- A. Nerve conduction
  - B. Phospholipid synthesis
  - C. Muscle contractility
  - D. Carbohydrate, fat, and electrolyte metabolism
- 68) Megaloblastic anaemia occurs in ?
- A. Vitamin B12 but not folic acid deficiency
  - B. Folic acid but not Vitamin B12 deficiency
  - C. Either Vitamin B12 or folic acid deficiency
  - D. Only combined Vitamin B12 + folic acid deficiency
- 69) When the entire CBC is suppressed due to either anemia, infection, or hemorrhage is called?
- A. Erythroplasia
  - B. Thrombocytopenia
  - C. Pancytopenia
  - D. Leukopenia
- 70) The best source of active bone marrow from a 20-year old would be:
- A. Iliac Crest (hip)
  - B. Femur (thigh)
  - C. Distal radius (forearm)
  - D. Tibia (shin)

71) Chinese letter arrangement, Metachromatic granules, tellurite hydrolysis and elek test is characteristic of which bacteria ?

- A. *Listeria monocytogenes*
- B. *Bacillus anthracis*
- C. *Corynebacterium diphtheriae*
- D. *Moraxella catarrhalis*

72) Which one of the following leukocyte count will increase in parasitic and allergic reactions ?

- A. Neutrophils
- B. Lymphocytes
- C. Eosinophils
- D. Basophils

73) An elevated urine urobilinogen and negative test for urine bilirubin may indicate which of following condition ?

- A. Acute Hepatic Toxicity
- B. Biliary Abstruction
- C. Hemolytic Diseases
- D. Urinary Tract Infection (UTI)

74) Kala- Azar Disease is caused by which Parasite ?

- A. *Lieshmania donovani*
- B. *Trypanosoma Cruzi*
- C. *Wucheria Bancrofti*
- D. *Plasmodium*

75) When myocardial infarction will happen which of the following cardiac enzyme will elevate first ?

- A. LDH
- B. CK
- C. ALT
- D. AST

76) Three types of ketone bodies include acetoacetic acid, acetone and -?

- A. Oxaloacetic acid
- B. Lactic Acid
- C. 3-hydroxy Butilic acid
- D. Acietic Acid

- 77) Which one of the following bacteria can cause glomerular nephritis or FR ?
- A. Staphylococcus aureus
  - B. Streptococcus Pyogenes
  - C. Staphylococcus Epidermidis
  - D. Streptococcus Pneumonia
- 78) Which one of the following hormone is produced by pituitary gland ?
- A. TRH
  - B. T4
  - C. TSH
  - D. Insulin
- 79) Which of the following is called "bad" Cholesterol ?
- A. Cholesterol
  - B. Triglyceride
  - C. HDL
  - D. LDL
- 80) One of the following is major cation found in extracellular fluid?
- A. Sodium
  - B. Potassium
  - C. Magnesium
  - D. Zinc
- 81) Which of the following condition shows Bence-Jones protein in urine ?
- A. Acute myeloid Leukemia
  - B. Malignant lymphoma
  - C. Multiple myeloma
  - D. Chronic myeloid Leukemia
- 82) Which blood group is known as "Universal Donor" ?
- A. O group
  - B. A group
  - C. B group
  - D. AB group
- 83) VDRL test is used for detecting which of the following disease?
- A. Rabies
  - B. Syphilis
  - C. Typhoid
  - D. Weils disease

- 84) Which of the following is non – ionizing radiation
- A. X-ray
  - B. Beta Rays
  - C. Alpha rays
  - D. Microwave
  - E. Gamma rays
- 85) What modification is needed for proper radiographic image in a heavy bony built person?
- A. Increased mA
  - B. Increased kVp
  - C. Increased exposure time
  - D. Increased developing time
- 86) SI unit of absorbed dose of radiation is
- A. Roentgen
  - B. Gray
  - C. Sievert
  - D. Coulomb
- 87) CT or Hounsfield number depends upon
- A. Mass density
  - B. Electron density
  - C. Atomic number
  - D. Atomic mass
- 88) Investigation of choice in whole body imaging in metastasis is
- A. MRI
  - B. Angiography
  - C. Venography
  - D. PET scan
- 89) Frequency of Ultrasound wave in USG
- A. 200 Hz
  - B. 500 Hz
  - C. <2 MHz
  - D. > 2 MHz
- 90) Alpha is similar to
- A. Electron
  - B. Proton
  - C. Neutron
  - D. Helium



- 91) Light ray and x-ray have same
- A. Velocity
  - B. Wavelength
  - C. Energy
  - D. Frequency
- 92) PACS in medical imaging stand for
- A. Portal archiving common system
  - B. Photo archiving computerized system
  - C. Picture archiving communication system
  - D. Planning archiving communication scheme
- 93) The study using barium for small intestine is known as
- A. Barium meal follow through
  - B. Barium swallow
  - C. Barium enema
  - D. None of above
- 94) Which of the following is a non – iodine containing contrast?
- A. Gadolinium
  - B. Visipaque
  - C. Iopamidol
  - D. Diatrizoate
- 95) IV contrast is not used in
- A. CECT
  - B. MRI
  - C. IVP
  - D. Myelography
- 96) Contrast in x-ray is predominantly dependent on
- A. kV
  - B. mA
  - C. Duration of exposure
  - D. Distance between source and object
- 97) Fracture of nose, which view x-ray taken
- A. Water's view
  - B. Caldwell's view
  - C. Lateral view
  - D. Occlusive anterior view
- 98) Investigation of choice for subdural hemorrhage is
- A. Angiography
  - B. NCCT
  - C. CECT
  - D. MRI
- 99) MRI is not better than CT for detection of
- A. Ligament injury
  - B. Soft tissue tumor
  - C. Meningeal pathology
  - D. Calcified lesion
- 100) X-ray artifact is
- A. A radiolucent area
  - B. Any abnormal opacity in the radiograph
  - C. Produced when patient moves while taking shoot
  - D. Any of the above

**Answer Key:**

<b>Part – A Research Methodology</b>					<b>Part – B Paramedical</b>				
1	B		26	B	51	C		76	C
2	B		27	B	52	A		77	B
3	C		28	C	53	A		78	C
4	B		29	A	54	D		79	D
5	A		30	C	55	D		80	A
6	A		31	C	56	A		81	C
7	A		32	A	57	C		82	A
8	D		33	C	58	C		83	B
9	A		34	C	59	C		84	D
10	D		35	D	60	A		85	B
11	A		36	C	61	C		86	B
12	A		37	B	62	C		87	A
13	C		38	C	63	D		88	D
14	A		39	B	64	A		89	D
15	B		40	C	65	A		90	D
16	C		41	C	66	A		91	A
17	C		42	B	67	B		92	C
18	B		43	B	68	C		93	A
19	C		44	A	69	C		94	A
20	A		45	A	70	A		95	D
21	D		46	A	71	C		96	A
22	D		47	C	72	C		97	C
23	C		48	B	73	C		98	B
24	C		49	C	74	A		99	D
25	A		50	B	75	B		100	C