

Question Booklet No.

(To be filled up by the candidate by **blue/black ball-point pen**)

Roll No.

--	--	--	--	--	--	--	--	--	--

Roll No. (Write the digits in words)

Serial No. of OMR Answer Sheet

Day and Date

(Signature of Invigilator)

INSTRUCTIONS TO CANDIDATES(Use only **blue/black ball-point pen** in the space above and on both sides of the **Answer Sheet**)

1. Within 10 minutes of the issue of the Question Booklet, Please ensure that you have got the correct booklet and it contains all the pages in correct sequence and no page/question is missing. In case of faulty Question Booklet, bring it to the notice of the Superintendent/Invigilators immediately to obtain a fresh Question Booklet.
2. Do not bring any loose paper, written or blank, inside the Examination Hall *except the Admit Card without its envelope*.
3. *A separate Answer Sheet is given. It should not be folded or mutilated. A second Answer Sheet shall not be provided.*
4. Write your Roll Number and Serial Number of the Answer Sheet by pen in the space provided above.
5. *On the front page of the Answer Sheet, write by pen your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, wherever applicable, write the Question Booklet Number and the Set Number in appropriate places.*
6. *No overwriting is allowed in the entries of Roll No., Question Booklet No. and Set No. (if any) on OMR sheet and Roll No. and OMR sheet No. on the Question Booklet.*
7. *Any changes in the aforesaid-entries is to be verified by the invigilator, otherwise it will be taken as unfair means.*
8. *This Booklet contains 40 multiple choice questions followed by 10 short answer questions. For each MCQ, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the Answer Sheet. For answering any five short Answer Questions use five Blank pages attached at the end of this Question Booklet.*
9. For each question, darken only one circle on the Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.
10. *Note that the answer once filled in ink cannot be changed.* If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero marks).
11. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.
12. Deposit *both OMR Answer Sheet and Question Booklet* at the end of the Test.
13. You are not permitted to leave the Examination Hall until the end of the Test.
14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as the University may determine and impose on him/her.

Total No. of Printed Pages : 15

FOR ROUGH WORK

11/2

Research Entrance Test – 2013

No. of Questions : 50

Time : 2 Hours

Full Marks : 200

- Note :** (i) This Question Booklet contains 40 Multiple Choice Questions followed by 10 Short Answer Questions.
- (ii) Attempt as many MCQs as you can. Each MCQ carries 3 (Three) marks. 1 (One) mark will be deducted for each incorrect answer. Zero mark will be awarded for each unattempted question. If more than one alternative answers of MCQs seem to be approximate to the correct answer, choose the closest one.
- (iii) Answer only 5 Short Answer Questions. Each question carries 16 (Sixteen) marks and should be answered in 150-200 words. Blank 5 (Five) pages attached with this booklet shall only be used for the purpose. Answer each question on separate page, after writing Question No.

1. The process of copying genetic information from DNA to RNA is known as
 - (1) Translation
 - (2) Replication
 - (3) Transcription
 - (4) Ligation
2. Separation and isolation of DNA is carried by
 - (1) Gel electrophoresis
 - (2) Polymerase chain reaction
 - (3) Bioreactors
 - (4) Cloning vectors
3. Which is not a sexually transmitted disease
 - (1) HIV
 - (2) Hepatitis B
 - (3) Listeriosis
 - (4) Chlamydiasis
4. Barr body is an
 - (1) Autosome
 - (2) X chromosome
 - (3) Y chromosome
 - (4) Mutated chromosome
5. Which is not a connective tissue
 - (1) Bone
 - (2) Cartilage
 - (3) Adipose tissue
 - (4) Muscular tissue
6. Antibodies are responsible for
 - (1) Cell mediated immunity
 - (2) Humoral immunity
 - (3) Innate immunity
 - (4) Autoimmunity
7. Hair is made of
 - (1) Elastin
 - (2) Fibrin
 - (3) Keratin
 - (4) Reticulin
8. Sympathetic nervous system has
 - (1) Craniosacral flow
 - (2) Cerebrocortical flow
 - (3) Thoracolumbar flow
 - (4) Diencephalic flow
9. Microglial cells are present in
 - (1) Liver
 - (2) Kidney
 - (3) Spleen
 - (4) Brain
10. Mitral valve is present between
 - (1) Left ventricle and aorta
 - (2) Right ventricle and pulmonary trunk
 - (3) Left atrium and left ventricle
 - (4) Right atrium and right ventricle

11. To determine a sample size to compare the two population's proportion, one require :
- (1) Only α (2) Only α and β
 (3) Only anticipated difference (4) All α, β and anticipated difference
12. Which design of experiment is most efficient ?
- (1) Completely randomized design (2) Randomized block design
 (3) Latin square design (4) All above are with same efficiency
13. Null hypothesis to test the two population's proportions is written as :
- (1) $H_0 : P_1 < P_2$ (2) $H_0 : P_1 > P_2$
 (3) $H_0 : P_1 = P_2$ (4) $H_0 : P_1 \neq P_2$
14. The mean square is the sum of squares divided by :
- (1) The total number of observations
 (2) Its corresponding degrees of freedom
 (3) Its corresponding degrees of freedom minus one
 (4) None of these alternatives is correct
15. In factorial designs, the response produced when the treatments of one factor interact with the treatments of another in influencing the response variable is known as :
- (1) Main effect (2) Replication
 (3) Interaction (4) None of these alternatives
16. Which of the odds ratio is considered to be insignificant ?
- (1) Both lower limit and upper limit of confidence interval is more than one
 (2) Both lower limit and upper limit of confidence interval is less than one
 (3) Lower limit is less than one and upper limit is more than one
 (4) None of the above
17. 'Demography Processes' does not include :
- (1) Fertility (2) Morbidity
 (3) Mortality (4) Social mobility
18. If annual growth rate of population is 1.5-2% the population is likely to get doubled in :
- (1) 18-20 years (2) 20-23 years
 (3) 28-35 years (4) 35-47 years

19. The denominator used for calculating literacy rate of Indian population (census 2001) is :
- (1) Total mid-year population (2) Population aged 7 years or more
 (3) School going population (4) Population aged 18 years or more
20. If the total fertility rate of India is 2.2, the crude birth rate would be :
- (1) 18.6 per 1000 population (2) 19.2 per 1000 population
 (3) 22.4 per 1000 population (4) 26.2 per 1000 population
21. To achieve Net Reproduction Rate of 1, the couple protection rate should be :
- (1) 50% (2) 55% (3) 60% (4) 65%
22. The probability that a working steel cutting machine breaks down during a time interval (given that it has not broken down before that time interval) is approximately proportional to the length of that time interval. Denote by (X) the total time elapsed before the machine breaks down. (X) can be assumed to have a :
- (1) Poisson distribution (2) Gamma distribution
 (3) Uniform distribution (4) Exponential distribution
23. Intention to treat analysis is done in :
- (1) Cohort study (2) Survival analysis
 (3) Randomised control trials (4) Multiple time series studies
24. Matching is done to remove :
- (1) Confounding factors (2) Selection bias
 (3) Observation bias (4) Sampling error
25. Sentinel surveillance is done to detect :
- (1) Missing number of cases
 (2) Total number of cases
 (3) Incidence of disease
 (4) Factors affecting occurrence of diseases
26. A die is rolled twice. Let A, B, C denote the events respectively that the sum of scores is 6, the sum of scores is seven and the first score is four. Select the correct from following :
- (1) A and C are independent (2) B and C are independent
 (3) A, B and C are disjoint (4) A and B are disjoint

27. The incidence of occupational disease in an industry is such that the employees have 20% of chance of suffering from it. What is probability that out of Six workmen, one or more will contract the disease :
- (1) 0.015 (2) 0.517 (3) 0.119 (4) 0.738
28. Which of the following is not related with transportation problem ?
- (1) Degeneracy (2) Stepping stone method
(3) North West corner rule (4) Unbiaseness
29. Multiple correlation is :
- (1) Simple correlation between two variables
(2) Simple correlation between a variable and linearly related other variables
(3) Simple correlation of two variables after removing linear effect of other variables on it
(4) None of these
30. Trend value in a time series can not be obtained by :
- (1) Least square method (2) Logistic growth curve
(3) Second degree parabola (4) Link relative method
31. Which of the following loss functions is symmetric loss function ?
- (1) Quadratic loss function (2) LINEX loss function
(3) Absolute loss function (4) None of these
32. In stratified random sampling in which allocation cost function is incorporated is known as :
- (1) Equal allocation (2) Proportional allocation
(3) Neyman's allocation (4) Optimum allocation
33. In type II censoring, which statement is true ?
- (1) Number of events occurred and time both are fixed
(2) Number of events occurred is fixed and time is random
(3) Number of events occurred is random and time is fixed
(4) Number of events occurred and time both are random
34. The preparation of sampling frame is not possible, then which sampling method will be appropriate to select the sample ?
- (1) Systematic sampling (2) Cluster sampling
(3) Stratified random sampling (4) Quota sampling
35. If the transition probability p_{jk} is independent of n , then Markov Chain is said to be :
- (1) Non homogeneous
(2) Non homogeneous and homogeneous both
(3) Homogeneous
(4) None of them

- 36.** The effect of change of origin and scale both are not on :
- (1) Mean
 - (2) Standard deviation
 - (3) Correlation
 - (4) Range
- 37.** Endemic means that a disease :
- (1) Occurs clearly in excess of normal expectation
 - (2) Affects a large geographical area of a country
 - (3) Exhibits a seasonal pattern
 - (4) Is habitually present in human populations
- 38.** Which of the following regarding Maternal Mortality Rate (MMR) is not true ?
- (1) Numerator includes total number of female deaths within 24 days of delivery
 - (2) Denominator includes still births and abortions
 - (3) It is expressed as a rate and not ratio
 - (4) It is expressed per 1000
- 39.** Which of the following statements about confidence limits/interval is true ?
- (1) Smaller the confidence level larger will be confidence interval
 - (2) Less variable the data, wider will be confidence interval
 - (3) Sample size does not affect the confidence interval
 - (4) 95% confidence interval will cover 2 standard errors around the mean
- 40.** A standard 'Z score' is related to :
- (1) Binomial distribution
 - (2) Normal distribution
 - (3) Chi-square test
 - (4) t-test

Attempt any five questions. Write answer in 150-200 words. Each question carries 16 marks. Answer each question on separate page, after writing Question Number.

1. Explain the reasons for difference in the age-specific mortality curves for developing and developed countries.
2. What are the causes of rural to urban migration in developing countries ?
3. Let $X_1, X_2, X_3, \dots, X_n$ are random sample from Poisson (θ). If prior distribution for θ is gamma (a, b) then obtain posterior distribution and posterior mean of θ .
4. Step up selection methods for selecting variables within a cox model.
5. Mention various steps in preparing research proposal for a study.
6. What is a design of experiment ? Why the three components randomization, local control and replication is considered in design of experiment. Write the advantages and disadvantages of completely randomized design.
7. Show that log of logistic regression equation is of linear form. How the relative importance of the coefficients can be compared.
8. Describe the dynamics of disease transmission. Explain different modes of transmission.
9. Define Health and give a brief account of determinants of Health.
10. Discuss various steps to conduct a Randomized Controlled Clinical Trial to compare the efficacy of two drugs having potential to control mild to moderate grade of hypertension.

Roll No. :

Q. No. :

Roll No. :

Q. No. :

Roll No. :

Q. No. :

Roll No. :

Q. No. :

Roll No. :

Q. No. :

FOR ROUGH WORK

