

Total No. of Printed Pages: 06

No. of Questions: 50

Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar
PET 2024 (9040) Doctor of Philosophy(Civil Engineering)

(To be filled by the Candidate)

Candidate Seat Number
(As per Admit card)

| | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

OMR Sheet Number

| | | | | | | | |
|--|--|--|--|--|--|--|--|
| | | | | | | | |
|--|--|--|--|--|--|--|--|

| |
|--|
| |
|--|

Invigilator's signature with Date

Candidate's Seat No. in Words

: _____

Name of the Center

: _____

Paper Code & Name of Examination

: 9040- Doctor of Philosophy(Civil Engineering)

Date: 03/10/2024

PET 2024 - EXAMINATION

Time: One Hours

Total Marks: 100

Important Instructions for the candidate

- Write your seat number and OMR Sheet number on the question paper in the earmarked space
- This question paper carries Fifty (50) Multiple-choice type questions and each question carries 2 Marks
- At the commencement of examination, the question paper will be given to the student.
- Each question has four alternative responses marked (A) (B) (C) and (D). You have to darken the circle as indicated below on the correct response against each question
Example: where (C) is correct answer

Ⓐ

Ⓑ

●

Ⓓ

- Your responses to the answer are to be indicated in the OMR Sheet. If you mark at any place other than in the circle in the OMR Sheet it will not be evaluated.
- Rough work is to be done at the end of this question paper.
- You have to return OMR answer sheet and question paper to the invigilator at the end of examination compulsorily and must not carry with you outside the examination hall.
- Use only Black / Blue ball point pen
- Use of any type of calculator or log table etc. is prohibited.
- There is no negative marking for incorrect answers

विद्यार्थ्यांसाठी महत्त्वाच्या सूचना

- परीक्षार्थींनी आपला आसन क्रमांक या पृष्ठावरील वरच्या कोपऱ्यात तसेच आपणास दिलेल्या उत्तर पत्रिकेचा क्रमांक त्याखाली लिहावा.
- या प्रश्नपत्रिकेतील सर्व प्रश्न सोडवणे अनिवार्य आहे.
- परीक्षा सुरु झाल्यावर विद्यार्थ्यांला प्रश्नपत्रिका दिली जाईल.
- प्रत्येक प्रश्नासाठी (A) (B) (C) (D) अशी चार विकल्प उत्तरे दिली आहेत, त्यातील योग्य उत्तराचा रकाना खाली दर्शविल्याप्रमाणे ठळकपणे काळा निळा करावा.
उदा: जर (C) हे उत्तर योग्य असेल तर

Ⓐ

Ⓑ

●

Ⓓ

- या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे ओएमआर उत्तर पत्रिकेतच दर्शवावीत इतर ठिकाणी लिहिलेली उत्तरे तपासली जाणार नाहीत.
- प्रश्नपत्रिकाच्या शेवटी कोऱ्या जागेवरच कच्चे काम करावे
- परीक्षा संपल्यानंतर विद्यार्थ्यांनी मूळ ओ. एम. आर उत्तरपत्रिका पर्यवेक्षकाकडे परत करणे आवश्यक आहे तथापि प्रश्नपत्रिका व ओ. एम. आर. उत्तरपत्रिका आपल्याबरोबर नेण्यास विद्यार्थ्यांला परवानगी नाही.
- फक्त काळ्या किंवा निळ्या बॉलपेनचाच वापर करावा
- कॅल्क्युलेटर किंवा लॉग टेबल वापरण्यास परवानगी नाही
- चुकीच्या उत्तरासाठी गुण कपात केली जाणार नाही

- | Q. No. | Question |
|--------|--|
| 1. | A particle of mass 2kg is travelling at velocity of 1.5m/s. A force $F(t) = 3t^2$ (in newton) is applied to it in the direction of motion for the duration of 2 seconds, where t denotes time in seconds. The velocity (in m/s, up to one decimal place) of the particle immediately after the removal of force is _____ (A) 4.8 m/s (B) 6.8 m/s (C) 5.5 m/s (D) 7.0 m/s |
| 2. | Which of the below is the correct formula to find group index (GI) of soil? (A) $GI = 0.1a + 0.0025ac + 0.005bd$ (B) $GI = 0.2a + 0.005ac + 0.01bd$ (C) $GI = 0.01a + 0.025ac + 0.05bd$ (D) $GI = 0.02a + 0.05ac + 0.001bd$ |
| 3. | A theodolite was setup at a station P. The angle of depression to a vane 2m above the foot of staff held at another station Q was 45° . The horizontal distance between station P & Q is 20m. The staff reading at bench mark S of RL 433.050m is 2.905m. Neglecting the errors due to curvature and refraction, the RL of station Q (in meters), is _____ (A) 413.050 (B) 413.995 (C) 435.955 (D) 431.050 |
| 4. | Which among the following is the standard symbol for Atwood number? (A) Ar (B) A (C) a (D) AR |
| 5. | In the Bowl's method for finding the effect of water table, which of the following factor is used for soil in the wedge zone? (A) Water reduction factor (B) Effective unit weight (C) Overburden pressure (D) Average unit weight |
| 6. | Jet propulsion works on the principle of _____ (A) Newton's first law (B) Newton's second law (C) Newton's third law (D) Thermodynamic properties |
| 7. | Which among the following is the formula for Force when it strikes the plate? (A) pav^2 (B) pav (C) pa (D) maE |
| 8. | The void ratio and specific gravity of soil are 0.65 and 2.72 respectively. The degree of saturation (in percentage) corresponding to water content is _____ (A) 65.3 (B) 20.9 (C) 83.7 (D) 54.4 |
| 9. | A close tank contains 0.5m thick layer of mercury (specific gravity=13.6) at the bottom, a 2m thick layer of water lies above the mercury layer. A 3m thick layer of oil (specific gravity = 0.6) lies above the water layer. The space above the oil layer contains air under pressure. The gauge pressure at the bottom of tank is 196.2 KN/m^2 . The density of water is 1000 Kg/m^3 and the acceleration due to gravity is 9.81 m/s^2 . The value of pressure in the air space is _____. (A) 92.214 KN/m^2 (B) 95.644 KN/m^2 (C) 98.922 KN/m^2 (D) 99.321 KN/m^2 |

10. The Atterberg limits of a clay are 38%, 27% and 24.5%. Its natural water content is 30%. The clay is in _____ state.
- (A) Plastic (B) Semi solid
(C) Liquid (D) Semi liquid
11. Which of the following type of method is adopted for research studies on crops?
- (A) Lysimeter Method (B) Drip Irrigation Method
(C) Phytometer Method (D) Furrow Irrigation Method
12. Which of the following is true about bracket connections?
- (A) They are used to give aesthetic appearance to the structure
(B) These connections are used to accommodate less number of bolts
(C) Fabrication cost is low
(D) More rigid than any other connection
13. The value of Reynolds number R is 1.5. The coefficient of drag is?
- (A) 8 (B) 10
(C) 12 (D) 16
14. A pretension in concrete member of a section 200mm X 250mm contains tendons of area 500mm^2 at a centre of the section. The prestress in the tendons is 1000N/mm^2 . Assuming modular ratio as 10, the stress (N/mm^2) in concrete is _____
- (A) 11 (B) 9
(C) 7 (D) 5
15. Construction of cavity walls as external walls to protect the building from the outside heat or cold as the hollow space between two walls act as an _____
- (A) Destructive material (B) Burning material
(C) Building material (D) Insulating material
16. The ultimate BOD of waster water whose 5 days BOD $(\text{BOD})_5$ and rate constant (base e) respectively 150mg/L and $0.23/\text{day}$ is _____
- (A) 80 mg/L (B) 150 mg/L
(C) 180 mg/L (D) 220 mg/L
17. A box measuring $50\text{cm} \times 50\text{cm} \times 50\text{cm}$ is filled to the top with dry coarse aggregate of mass 187.5kg . The water absorption of specific gravity of the aggregate 0.5% 2.5 , respectively. The maximum quantity of water (in kg. round off to 2 decimal places) required to fill the box completely is _____
- (A) 50.94kg (B) 45.28kg
(C) 54.18kg (D) 65.00kg
18. The benchmark has been established at the soffit of an ornamental arch at the known elevation of 100.0m above the mean sea level. The backsight used to establish height of instrument is an inverted staff reading of 2.105m . A forward sight reading with normally held staff of 1.105m is taken on recently constructed plinth. The elevation of plinth is _____
- (A) 103.210 m (B) 101.000 m
(C) 99.000 m (D) 96.790 m
19. Cantilever scaffolding is also known as _____
- (A) Mason's scaffolding (B) Suspended scaffolding
(C) Needle scaffolding (D) Ladder scaffolding

20. Which of the following line is usually parallel to the plot boundaries and laid down in each case by the Authority, beyond which nothing can be constructed towards the site boundaries?
- (A) Property line (B) Building line
(C) Plot line (D) Control line
21. What does “3-Es” of traffic engineering stand for?
- (A) Engineering, education and enthusiasm
(B) Engineering, education and enforcement
(C) Engineering, education and expulsion
(D) Enforcement, empowerment and eradication
22. What is the modular ratio for M50 grade concrete?
- (A) 5.83 (B) 18.67
(C) 6.44 (D) 7.18
23. The magnitude of the only shear stresses acting at a point in a plane stress situation is 7.5 N/mm^2 . The magnitude of principal stresses will be _____
- (A) $+ 15.0 \text{ N/mm}^2$ and $- 7.5 \text{ N/mm}^2$ (B) $+ 7.5 \text{ N/mm}^2$ and $+15.0 \text{ N/mm}^2$
(C) $+ 7.5 \text{ N/mm}^2$ and $- 7.5 \text{ N/mm}^2$ (D) $+ 10.0 \text{ N/mm}^2$ and $- 7.5 \text{ N/mm}^2$
24. In the equation $U=0.9D + 1.6W + 1.6H$, what is the load factor for H if the structural action of H counteracts that due to W or E?
- (A) 0.005 (B) 0
(C) 0.1 (D) 0.05
25. Which of the following is a method used to estimate potential evapotranspiration?
- (A) Hazen-Williams equation (B) Manning’s equation
(C) Chezy’s equation (D) Thornthwaite equation
26. Research is search for new -----.
- (A) Knowledge (B) Commodity
(C) Country (D) World
27. Cluster sampling, stratified sampling and systematic sampling are types of
- (A) Direct sampling (B) Indirect sampling
(C) Random sampling (D) Non-random sampling
28. Theresearchismainlyfocusingtestingtheoriesandhypothesisratherthanitspractical applicability. It is known as?
- (A) Applied research (B) Pure research
(C) Action research (D) Participatory research
29. Methods of research means ----- of research.
- (A) Publish (B) Conduct
(C) Publicity (D) Presentation
30. Research methodology ----- problem
- (A) Deviates (B) Intensifies
(C) Solves (D) Neglects
31. Quantitative and Qualitative research are -----.
- (A) Same (B) Unique
(C) Different (D) One

32. Research process does not include -----.
- (A) Publication (B) Hypothesis
(C) Design (D) Problem
33. ----- research is important.
- (A) Pure (B) Applied
(C) Quantitative (D) Descriptive
34. Which of the following is a characteristic of quantitative research?
- (A) Subjective interpretation (B) Focus on numerical data
(C) Use of open-ended questions (D) Emphasis on participant observation
35. What is the primary purpose of a literature review in research methodology?
- (A) To summarize statistical results
(B) To provide background information on the topic
(C) To describe research methodology used in the study
(D) To critique existing research studies
36. Interview is a source of ----- data
- (A) Primary (B) Secondary
(C) Time series (D) All
37. Schedule and Questionnaire are the -----.
- (A) Same (B) Unique
(C) Different (D) None
38. More scientific sampling method is -----.
- (A) Purposive (B) Convenient
(C) Quota (D) Random
39. To avoid plagiarism in research ----- is useful.
- (A) Copy (B) Citation
(C) Bibliography (D) None
40. References and Bibliography are the -----
- (A) Same (B) Unique
(C) Different (D) None
41. Method of references in research is -----
- (A) APA (B) ACA
(C) ABA (D) ADA
42. Ethics in research is discarded by -----.
- (A) Copy (B) Plagiarism
(C) Sample (D) Census
43. The process of reviewing existing literature to gather information and ideas related to a research topic is known as:
- (A) Data analysis (B) Data collection
(C) Literature review (D) Data interpretation

44. In a normal distribution curve, what percentage of data falls within one standard deviation from the mean?
 (A) 68% (B) 75%
 (C) 95% (D) 99.7%
45. What is the main difference between inductive and deductive reasoning?
 (A) Inductive reasoning starts with a theory, while deductive reasoning starts with a data.
 (B) Inductive reasoning aims to conform existing theories, while deductive reasoning aims to explore new theories.
 (C) Inductive reasoning starts with data to develop a theory, while deductive reasoning tests a theory with data
 (D) Inductive reasoning uses qualitative data, while deductive reasoning uses quantitative data
46. Which of the following is a measure of dispersion?
 (A) Mean (B) Median
 (C) Range (D) Mode
47. Which of the following is NOT a type of experimental design?
 (A) Pre-experimental design (B) Quasi-experimental design
 (C) True experimental design (D) Descriptive design
48. Which of the following is an example of a continuous variable?
 (A) Gender (B) Marital status
 (C) Age (D) Country of residence
49. Which of the following is NOT a type of probability sampling technique?
 (A) Cluster sampling
 (B) Convenience sampling
 (C) Stratified sampling
 (D) Random sampling
50. An image, perception or concept that is capable of measurement is called
 (A) Scale (B) Hypothesis
 (C) Type (D) Variable
