

Total No. of Printed Pages: 06

No. of Questions : 50

Dr. Babasaheb Ambedkar Marathwada University, Chhatrapati Sambhajinagar
PET 2024 (9041) Doctor of Philosophy(Electronics Engineering)

(To be filled by the Candidate)

Candidate Seat Number
(As per Admit card)

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OMR Sheet Number

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Invigilator's signature with Date

Candidate's Seat No. in Words : _____

Name of the Center : _____

Paper Code & Name of Examination : **9041 - Doctor of Philosophy(Electronics 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

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- 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 सुरू 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

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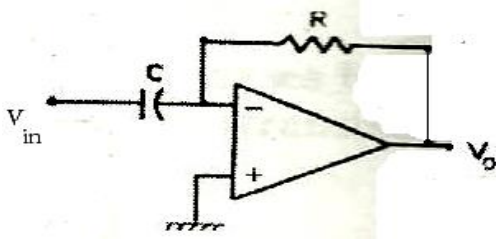
- या प्रश्नपत्रिकेतील प्रश्नांची उत्तरे ओएमआर उत्तर पत्रिकेतच दर्शवावीत इतर ठिकाणी लिहिलेली उत्तरे तपासली जाणार नाहीत.
- प्रश्नपत्रिकाच्या शेवटी कोऱ्या जागेवरच कच्चे काम करावे
- परीक्षा संपल्यानंतर विद्यार्थ्यांनी मूळ ओ. एम. आर उत्तरपत्रिका पर्यवेक्षकाकडे परत करणे आवश्यक आहे तथापि प्रश्नपत्रिका व ओ. 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. | -----is a preferred sampling method for the population with finite size.
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Systematic sampling</td> <td style="width: 50%;">(B) Purposive sampling</td> </tr> <tr> <td>(C) Cluster sampling</td> <td>(D) Area sampling</td> </tr> </table> | (A) Systematic sampling | (B) Purposive sampling | (C) Cluster sampling | (D) Area sampling |
| (A) Systematic sampling | (B) Purposive sampling | | | | |
| (C) Cluster sampling | (D) Area sampling | | | | |
| 2. | An image, perception or concept that is capable of measurement is called-----
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Scale</td> <td style="width: 50%;">(B) Hypothesis</td> </tr> <tr> <td>(C) Type</td> <td>(D) Variable</td> </tr> </table> | (A) Scale | (B) Hypothesis | (C) Type | (D) Variable |
| (A) Scale | (B) Hypothesis | | | | |
| (C) Type | (D) Variable | | | | |
| 3. | Which of the following is NOT the characteristic of a research?
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Research is systematic</td> <td style="width: 50%;">(B) Research is not passive</td> </tr> <tr> <td>(C) Research is not a process</td> <td>(D) Research is problem oriented</td> </tr> </table> | (A) Research is systematic | (B) Research is not passive | (C) Research is not a process | (D) Research is problem oriented |
| (A) Research is systematic | (B) Research is not passive | | | | |
| (C) Research is not a process | (D) Research is problem oriented | | | | |
| 4. | Which of the following is not the method of Research?
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Survey</td> <td style="width: 50%;">(B) Historical</td> </tr> <tr> <td>(C) Observation</td> <td>(D) Philosophical</td> </tr> </table> | (A) Survey | (B) Historical | (C) Observation | (D) Philosophical |
| (A) Survey | (B) Historical | | | | |
| (C) Observation | (D) Philosophical | | | | |
| 5. | The study in which the investigators attempt to trace an effect is known as:
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Survey Research</td> <td style="width: 50%;">(B) Historical Research</td> </tr> <tr> <td>(C) Summative Research</td> <td>(D) 'Ex-post Facto' Research</td> </tr> </table> | (A) Survey Research | (B) Historical Research | (C) Summative Research | (D) 'Ex-post Facto' Research |
| (A) Survey Research | (B) Historical Research | | | | |
| (C) Summative Research | (D) 'Ex-post Facto' Research | | | | |
| 6. | Survey is a-----Study.
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Descriptive</td> <td style="width: 50%;">(B) Fact finding</td> </tr> <tr> <td>(C) Analytical</td> <td>(D) Systematic</td> </tr> </table> | (A) Descriptive | (B) Fact finding | (C) Analytical | (D) Systematic |
| (A) Descriptive | (B) Fact finding | | | | |
| (C) Analytical | (D) Systematic | | | | |
| 7. | Field-work based research is classified as:
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Historical</td> <td style="width: 50%;">(B) Empirical</td> </tr> <tr> <td>(C) Biographical</td> <td>(D) Experimental</td> </tr> </table> | (A) Historical | (B) Empirical | (C) Biographical | (D) Experimental |
| (A) Historical | (B) Empirical | | | | |
| (C) Biographical | (D) Experimental | | | | |
| 8. | Second step in problem formulation is
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Statement of the problem</td> <td style="width: 50%;">(B) Understanding the nature of the problem</td> </tr> <tr> <td>(C) Survey</td> <td>(D) Discussions</td> </tr> </table> | (A) Statement of the problem | (B) Understanding the nature of the problem | (C) Survey | (D) Discussions |
| (A) Statement of the problem | (B) Understanding the nature of the problem | | | | |
| (C) Survey | (D) Discussions | | | | |
| 9. | In order to augment the accuracy of the study a researcher
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Should be honest and unbiased</td> <td style="width: 50%;">(B) Should increase the size of the sample</td> </tr> <tr> <td>(C) Should keep the variance high</td> <td>(D) All of these</td> </tr> </table> | (A) Should be honest and unbiased | (B) Should increase the size of the sample | (C) Should keep the variance high | (D) All of these |
| (A) Should be honest and unbiased | (B) Should increase the size of the sample | | | | |
| (C) Should keep the variance high | (D) All of these | | | | |
| 10. | Cluster sampling, stratified sampling and systematic sampling are types of
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Direct sampling</td> <td style="width: 50%;">(B) Indirect sampling</td> </tr> <tr> <td>(C) Random sampling</td> <td>(D) Non random sampling</td> </tr> </table> | (A) Direct sampling | (B) Indirect sampling | (C) Random sampling | (D) Non random sampling |
| (A) Direct sampling | (B) Indirect sampling | | | | |
| (C) Random sampling | (D) Non random sampling | | | | |
| 11. | The research that is especially carried out to test and validate the study hypotheses is termed
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Fundamental research</td> <td style="width: 50%;">(B) Applied research</td> </tr> <tr> <td>(C) Conclusive research</td> <td>(D) Exploratory research</td> </tr> </table> | (A) Fundamental research | (B) Applied research | (C) Conclusive research | (D) Exploratory research |
| (A) Fundamental research | (B) Applied research | | | | |
| (C) Conclusive research | (D) Exploratory research | | | | |
| 12. | A comprehensive full Report of the research process is called
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(A) Thesis</td> <td style="width: 50%;">(B) Summary Report</td> </tr> <tr> <td>(C) Abstract</td> <td>(D) Article</td> </tr> </table> | (A) Thesis | (B) Summary Report | (C) Abstract | (D) Article |
| (A) Thesis | (B) Summary Report | | | | |
| (C) Abstract | (D) Article | | | | |

13. The format of thesis writing is the same as in
 (A) Writing of Seminar representation
 (B) Preparation of research paper/article
 (C) A research dissertation
 (D) Presenting a workshop/conference Paper
14. What type of chart is useful for comparing values over categories?
 (A) Pie Chart (B) Column Chart
 (C) Line Chart (D) Dot Graph
15. Reliability is the fundamental quality of a research which also reflects
 (A) Superiority (B) Purity of data
 (C) Verifiability (D) Validity
16. The-----feature of MS Excel quickly completes a series of data
 (A) Auto Complete (B) Auto Fill
 (C) Fill Handle (D) Sorting
17. The method by which a sample is chosen
 (A) Unit (B) Design
 (C) Random (D) Census
18. The-----scale measurement has a natural zero.
 (A) Rational (B) Nominal
 (C) Ordinal (D) Interval
19. Field study is related to
 (A) Real life situations (B) Laboratory situations
 (C) Experimental situations (D) None of these
20. Which of the following is a research tool
 (A) Graph (B) Illustration
 (C) Questionnaire (D) Diagram
21. An abstract is a
 (A) Synopsis (B) Quotations
 (C) Glossary (D) Bibliography
22. Which scale is the simplest form of measurement
 (A) Ordinal (B) Interval
 (C) Ratio (D) Nominal
23. A written format of a research work is known as
 (A) Research paper (B) Monograph
 (C) Project report (D) Research report
24. Assignment of numerals to the objects to represent their attributes is known as-----
 (A) Nominal data (B) Ordinal data
 (C) Interval data (D) Ratio data

25. Which of the following is true regarding research objectives?
- (A) Research objectives, when achieved, will provide sufficient earnings to obtain a reasonable return on investment.
 - (B) Research objectives, when obtained, will ensure the viability of the marketing research department.
 - (C) Research objectives, when achieved, provide the information necessary to solve the problem.
 - (D) Research objectives are seldom achieved but should be stated as goals to be sought.
26. A series RLC circuit has a resonance frequency of 1KHz and a quality factor $Q=100$. If each of R, L, and C is doubled from its original value, the new Q of the circuit is
- (A) 25
 - (B) 50
 - (C) 100
 - (D) 200
27. In LED, light is emitted because
- (A) Recombination of charges takes place
 - (B) Ions get heated and emit light
 - (C) Colour of diode material changes as light falls on it
 - (D) The surface becomes fluorescent
28. Which diode does not show the negative resistance region?
- (A) Gunn diode
 - (B) Tunnel diode
 - (C) Zener diode
 - (D) IMPATT diode
29. Which of the following is NOT associated with a p-n junction?
- (A) Junction capacitance
 - (B) Charge storage capacitance
 - (C) Depletion capacitance
 - (D) Channel length modulation
30. In a P+ N junction diode under reverse bias, the magnitude of electric field is maximum at the
- (A) Edge of depletion region on the p side
 - (B) Edge of the depletion region on the n side
 - (C) P+ N junction
 - (D) Centre of the depletion region on the n side
31. Boron is
- (A) Intrinsic semiconductor
 - (B) Extrinsic semiconductor
 - (C) Pentavalent impurity
 - (D) Trivalent impurity
32. The logic gate which detects equality of two bits is
- (A) EX-OR
 - (B) EX-NOR
 - (C) NOR
 - (D) NAND
33. Which of the following Boolean rules is correct?
- (A) $A + 0 = 0$
 - (B) $A + 1 = 1$
 - (C) $A + A = A.A$
 - (D) $A + AB = A + B$
34. The total external data memory that can be interfaced to the 8051 is
- (A) 32K
 - (B) 64K
 - (C) 128K
 - (D) 256K

35. Signal voltage ranges for a logic high and for a logic low in RS-232C standard are
 (A) Low = 0 volt to 1.8 volt, high = 2.0 volt to 5 volt
 (B) Low = -15 volt to -3 volt, high = +3 volt to +15 volt
 (C) Low = +3 volt to +15 volt, high = -3 volt to -15 volt
 (D) Low = 2 volt to 5.0 volt, high = 0 volt to 1.8 volt
36. Assume that the OPAMP of the figure is ideal. If V_{in} is a triangular wave, then V_o will be



- (A) Square wave
 (B) Triangular wave
 (C) Parabolic wave
 (D) Sine wave
37. Number of the times the instruction sequence below will loop before coming out of loop is
 MOV AL, 00H
 A1: INC AL
 JNZ A1
 (A) 00
 (B) 01
 (C) 255
 (D) 256
38. A DSP convolves each discrete sample with these coefficients: -0.25, -0.25, 1.0, -0.25, and -0.25. This must be a
 (A) Low-pass filter
 (B) High-pass filter
 (C) Band-pass filter
 (D) Band-stop filter
39. A digital-to-analog converter is an application of the
 (A) Scaling adder
 (B) Voltage-to-current converter
 (C) Non-inverting amplifier
 (D) Adjustable bandwidth circuit
40. A system with an input $x(t)$ and output $y(t)$ is described by the relation,
 $Y(t) = t x(t)$ This system is
 (A) Linear and time invariant
 (B) Linear and time varying
 (C) Non linear and time invariant
 (D) Non linear and time varying
41. Intensity range of 8 bit pixel image is
 (A) 0 to 7
 (B) 0 to 15
 (C) 0 to 31
 (D) 0 to 255
42. Consider $y(n) = x(n/2)$
 The DFT of $y(k)$ is
 (A) $x(k)$
 (B) $x(2k)$
 (C) $x(-k)$
 (D) $-x(k)$

43. Median Filter is used for
 (A) Noise removal (B) Image compression
 (C) Image segmentation (D) None of them
44. A PD controller is used to compensate a system. Compared to the uncompensated system, the compensated system has
 (A) A higher type number (B) Reduced damping
 (C) Higher noise amplification (D) Larger transient overshoot
45. The frequency range of satellite communication is
 (A) 1 KHz to 100 KHz (B) 100 KHz to 1000 KHz
 (C) 10 MHz to 30 MHz (D) 1 GHz to 30 GHz
46. High frequency waves are
 (A) Absorbed in F2 layer
 (B) Reflected by D layer
 (C) Capable of use for long distance communication on the moon
 (D) Affected by solar cycle
47. An ideal OPAMP is an ideal
 (A) Voltage controlled current source
 (B) Voltage controlled voltage source
 (C) Current controlled current source
 (D) Current controlled voltage source
48. A band limited signal is sampled at the Nyquist rate. The signal can be recovered by passing the sample through
 (A) An RC filter
 (B) An envelope detector
 (C) A PLL
 (D) An ideal low pass filter with the appropriate bandwidth
49. The reflection coefficient for a short circuit transmission line is
 (A) 1 (B) zero
 (C) 0.5 (D) -1
50. Which of the following antennas is best excited from a waveguide?
 (A) Bi conical (B) Horn
 (C) Helical (D) Discone
