A

GVR2

Electrical & Electronics Engineering

Duration of Test : 2 Hours   **Max. Marks : 100**

Hall Ticket No.

Name of the Candidate : _____

INSTRUCTIONS

1.   This Question Booklet consists of **100** multiple choice objective type questions to be answered in **2** hours.

2.   Every question in this booklet has 4 choices marked (A), (B), (C) and (D) for its answer.

3.   Each question carries **one** mark. There are no negative marks for wrong answers.

4.   This Booklet consists of **16** pages. Any discrepancy or any defect is found, the same may be informed to the Invigilator for replacement of Booklet.

5.   Answer all the questions on the OMR Answer Sheet using **Blue/Black ball point pen only.**

6.   Before answering the questions on the OMR Answer Sheet, please read the instructions printed on the OMR sheet carefully.

7.   OMR Answer Sheet should be handed over to the Invigilator before leaving the Examination Hall.

8.   Calculators, Pagers, Mobile Phones, etc., are not allowed into the Examination Hall.

9.   No part of the Booklet should be detached under any circumstances.

10. The seal of the Booklet should be opened only after signal/bell is given.

GVR2-A

ELECTRICAL AND ELECTRONICS ENGINEERING (EE)

PART – A

1. The primary turns of a 444 V/222 V, 50 Hz single-phase transformer with a core cross-sectional area of 100 cm^2, and a maximum flux density of 1.0 T is
    (A) 100   (B) 200   (C) 222   (D) 400

2. The condition for maximum regulation of a single-phase transformer with equivalent resistance, r_{eq}, equivalent reactance, x_{eq}, and load power factor angle, ϕ, is
    (A) $\cos\phi = \dfrac{x_{eq}}{r_{eq}}$ (B) $\cos\phi = \dfrac{r_{eq}}{x_{eq}}$ (C) $\tan\phi = -\dfrac{r_{eq}}{x_{eq}}$ (D) $\tan\phi = \dfrac{x_{eq}}{r_{eq}}$

3. The main application of delta/zig-zag connected 3-phase transformer is to supply
    (A) balanced loads   (B) unbalanced loads
    (C) furnace loads   (D) single-phase loads

4. Two transformers having the same p.u. impedance connected in parallel share the connected load
    (A) equally
    (B) in proportion to the respective ratings
    (C) in proportion to the voltage ratio
    (D) in proportion to the zero phase displacement

5. A 1100 kVA, 11 kV/1.1 kV conventional two-winding transformer is connected as a 12.1 kV/11 kV step-down auto-transformer. The rating of the auto-transformer is
    (A) 1000 kVA   (B) 1100 kVA   (C) 11000 kVA   (D) 12100 kVA

6. The energy density of magnetic field in a magnetic circuit is
    (A) inversely proportional to magnetic flux density
    (B) directly proportional to the absolute permeability
    (C) directly proportional to the magnetic flux density
    (D) directly proportional to the square of magnetic flux density

7. A shunt generator develops stable output voltage if
    (A) magnetization characteristic is linear
    (B) magnetization characteristic is non-linear
    (C) the field winding resistance is more than the critical resistance
    (D) the residual magnetism is equal to zero

8. In a differentially compounded dc motor
    (A) the speed is constant as the torque increases
    (B) the speed falls non-linearly as the torque increases
    (C) the speed increases non-linearly as the torque increases
    (D) the flux increases as the load increases

9. A 3-phase induction motor under locked rotor condition and with stator supply, induces
(A) small voltage at slip frequency   (B) large voltage at rotor frequency
(C) zero voltage at zero frequency   (D) large voltage at slip frequency

10. The equivalent rotor resistance, r_2' components in the equivalent circuit of a single-phase induction motor, based on two-revolving field theory, at any slip, s are

(A) $\dfrac{r_2'}{s}$ and $\dfrac{r_2'}{1-s}$ (B) $\dfrac{r_2'}{s}$ and $\dfrac{r_2'}{2-s}$

(C) $\dfrac{r_2'}{2s}$ and $\dfrac{r_2'}{2(1-s)}$ (D) $\dfrac{r_2'}{2s}$ and $\dfrac{r_2'}{2(2-s)}$

11. For a 210 MW, turbo-alternator in a thermal power plant, the possible specifications of rotor diameter, stator core length, and number of poles, respectively, are
(A) 4.4 m, 1.2 m, 12   (B) 1.2 m, 4.4 m, 2
(C) 4.4 m, 1.2 m, 24   (D) 1.2 m, 4.4 m, 8

12. The reluctance torque of a 3-phase salient pole synchronous generator with direct and quadrature axis reactance, x_d and x_q, respectively, is proportional to

(A) $x_d - x_q$ (B) $x_d \times x_q$ (C) $\dfrac{1}{x_d} - \dfrac{1}{x_q}$ (D) $\dfrac{1}{x_q} - \dfrac{1}{x_d}$

13. When two alternators are operating in parallel, the cause for circulating current is
(A) increase in the excitation of one machine
(B) increase in the driving torque of one machine
(C) reduction in angular velocity of one machine
(D) identical speed/load characteristics of both machines

14. The maximum possible power of a 3-phase synchronous motor with synchronous reactance 0.8 p.u. connected to a bus-bar of 1.0 p.u. and excitation adjusted to 1.2 p.u. is
(A) 0.5 p.u.   (B) 0.96 p.u.   (C) 1.5 p.u.   (D) 1.8 p.u.

15. A synchronous capacitor is
(A) an unloaded and under excited 3-phase synchronous motor
(B) a loaded and over excited 3-phase synchronous generator
(C) an unloaded and over excited 3-phase synchronous motor
(D) a 3-phase synchronous generator loaded with a capacitor bank

16. In the capacitor-start, capacitor-run single-phase induction motor
(A) two capacitors are connected across the main winding
(B) when the centrifugal switch opens, the permanent capacitor is left in the auxiliary winding circuit
(C) when the centrifugal switch opens, the permanent capacitor is left in the main winding circuit
(D) two capacitors are connected across the auxiliary winding.

17. The main purpose of permanent magnet motors are
    (A) to avoid the need for field supply (B) to provide high flux density
    (C) to provide control over flux level (D) to facilitate kW rating

18. The average load voltage across a resistive load of a single-phase bride converter connected with two SCRs and two diodes, operating at any firing delay angle, α and supplied at 200 V, 50 Hz is

    (A) $\dfrac{200}{\sqrt{2}\pi}\cos\alpha$

    (B) $\dfrac{\sqrt{2}\times 200}{\pi}\cos\alpha$

    (C) $\dfrac{\sqrt{2}\times 200}{\pi}(1+\cos\alpha)$

    (D) $\dfrac{200}{\sqrt{2}\pi}(1+\sin\alpha)$

19. In a dc-ac 3-phase MOSFET bridge inverter circuit, the switches are marked in a sequence as 1, 2, 3 in the top-half and 4, 5, 6 in the bottom half of the bridge. The triggering sequence of switches that gives balanced output voltage is
    (A) 1, 2, 3, 4, 5, 6   (B) 1, 5, 3, 4, 2, 6
    (C) 1, 6, 2, 4, 3, 5   (D) 1, 4, 2, 5, 3, 6

20. In a dc-dc converter, the switch duty ratio is defined as

    (A) $\dfrac{\text{turn - off time}}{\text{time period}}$

    (B) $\dfrac{\text{sawtooth voltage}}{\text{control voltage}}$

    (C) $\dfrac{\text{control voltage}}{\text{peak value of sawtooth voltage}}$

    (D) $\dfrac{\text{control voltage}}{\text{sawtooth voltage}}$

21. In a four-quadrant dc motor drive system controlled by two phase controlled converters, the current and voltage of converter 1 operating in I and IV quadrants, respectively, are
    (A) $I_a - ve, V_a + ve$ and $I_a + ve, V_a - ve$
    (B) $I_a + ve, V_a + ve$ and $I_a + ve, V_a - ve$
    (C) $I_a - ve, V_a + ve$ and $I_a - ve, V_a - ve$
    (D) $I_a + ve, V_a + ve$ and $I_a - ve, V_a - ve$

22. In a 3-phase inverter fed induction motor drive the total harmonic distortion is 4 %. If the maximum value of fundamental component of load current is 4 A. The rms value of net harmonic current is

    (A) 0.08 A   (B) $0.08\sqrt{2}$ A   (C) 0.16 A   (D) $0.16\sqrt{2}$ A

23. In a power generating station the Demand Factor and Load Factor are 0.5 and 0.2, respectively. If the connected load is 400 MW, the average demand is
    (A) 40 MW   (B) 100 MW   (C) 140 MW   (D) 280 MW

24. The constants B and C, respectively, of a medium transmission line by nominal T model are

    (A) $1+\dfrac{YZ}{2}, Z$ (B) $1+\dfrac{YZ}{2}, Y$ (C) $Z, Y(1+\dfrac{YZ}{4})$ (D) $Z(1+\dfrac{YZ}{4}), Y$

25. The main limitation for power handling capability of short length transmission lines and cables is
(A) power factor
(B) stability
(C) thermal effect limit
(D) conductor size

26. A travelling wave of surge resistance, R_o on a transmission line is terminated by a load resistance, R_L. If $R_L > R_o$ then there is
(A) no reflected wave
(B) partial reflection of reversal of current only
(C) partial reflection of reversal of voltage only
(D) reflection of reversal of both current and voltage

27. In a 3-phase 4-wire distribution system three unbalanced but equal magnitude impedances are connected between respective lines and neutral. The magnitude of current in the neutral conductor for RYB and RBY phase sequences are
(A) zero
(B) same
(C) different
(D) same in magnitude but differs in phase.

28. In a 3-insulator string voltage distribution system the ratio of capacitance between pin and earth to the self capacitance of each unit is 1/4. If the potential across the top unit is 8 kV, then the string voltage is
(A) 22.5 kV
(B) 24 kV
(C) 26 kV
(D) 32.5 kV

29. The Geometric Mean Radius of a phase conductor composed of four bundled conductors marked as 1, 2, 3, 4 each of radius, r and spaced at a distance, d from each other is
(A) $(rd_{12}d_{13}d_{14})^{1/4}$
(B) $(re^{-1/4}d_{12}d_{13}d_{14})$
(C) $(re^{-1/4}d_{12}d_{13}d_{14})^{1/2}$
(D) $(re^{-1/4}d_{12}d_{13}d_{14})^{1/4}$

30. The corona loss of a 3-phase transmission line is 100 kW at 60 kV/phase and 25 kW at 50 kV/phase. The disruptive critical voltage is
(A) 40 kV
(B) 43.6 kV
(C) 49.6 kV
(D) 50 kV

31. A 3-phase star-connected 75 MVA, 25 kV 3-phase synchronous generator has a synchronous reactance of 1.0 p.u. The per unit value to a 90 MVA base and 30 kV is
(A) 2/15 p.u.
(B) 5/6 p.u.
(C) 1.0 p.u.
(D) 1.2 p.u.

32. The Geometric Mean Radius of a conductor having 3- strands each of radius, r placed in the form of a triangle is
(A) $\sqrt[3]{r \times r \times r}$
(B) $\sqrt[3]{e^{-0.25} r \times 2r \times 2r}$
(C) $\sqrt[3]{e^{-0.5} r \times 2r \times 2r}$
(D) $\sqrt[3]{e^{-\frac{1}{3}} r \times 2r \times 2r}$

33. Reactive power compensation in feeders leads to
(A) poor voltage profile
(B) improved voltage profile
(C) negative and zero sequence currents
(D) expensive voltage regulators

34. The system voltage is enhanced during heavy load condition and reduced during light load condition by using
   (A) shunt capacitor
   (B) shunt reactor
   (C) active power filter
   (D) static VAR Compensator

35. A balanced star connected load takes 50 A from a balanced 3-phase, 4-wire supply. The zero and positive sequence components, I_a^0 and I_a^+ of the line current, I_a are
   (A) 0, 0
   (B) 0, 50 A
   (C) 50 A, 0
   (D) 50 A, 50 A

36. A 3-phase generator with a phase emf of 1.0 p.u. and with positive, negative and zero sequence reactances of 0.25 p.u., 0.25 p.u. and 0.1 p.u., respectively, is grounded through a reactance of 0.1 p.u. For a single-line to ground fault, the fault current is
   (A) $\dfrac{1}{j0.3}$
   (B) $\dfrac{1}{j0.7}$
   (C) $\dfrac{1}{j0.9}$
   (D) $\dfrac{3}{j0.7}$

37. In a 3-phase system for a line-to-line fault the positive, negative and zero sequence voltages V_{a1}, V_{a2}, V_{a0}, respectively, for phase voltage, V_a are related as
   (A) $V_{a1} + V_{a2} + V_{a0} = V_a$
   (B) $V_{a1} = V_{a2} = V_{a0}$
   (C) $V_{a1} = V_{a2}$
   (D) $V_{a1} + V_{a2} + V_{a0} = 0$

38. In induction type directional over current relay the driving torque is due to interaction of magnetic fields derived from
   (A) current in the potential coil
   (B) both voltage and current in the relay windings
   (C) directional element and non-directional element
   (D) non-directional element and the trip circuit

39. The operating characteristics of a reactance type distance relay
   (A) a stepped waveform for increasing reactance
   (B) a straight line for a constant reactance
   (C) a circle for a constant reactance
   (D) a set of circles for variable reactances

40. The prospective voltage across the circuit breaker contacts for a given series inductance, L and shunt capacitance, C is
   (A) directly proportional to (LC)
   (B) inversely proportional to (LC)
   (C) directly proportional to $\sqrt{(L/C)}$
   (D) inversely proportional to $\sqrt{(L/C)}$

41. Transient stability studies of a power system are usually carried out over a time period of
   (A) two or more seconds
   (B) several time swings
   (C) time interval of first swing
   (D) sustained oscillations

42. The swing equation for a synchronous machine is based on
(A) relative motion between load angle and stator magnetic field
(B) maximum power flow possible through a particular point
(C) net torque and angular displacement
(D) relation between excitation voltage and excitation current

43. The cascade amplifier is a multistage configuration of
(A) CE-CC   (B) CE-CB   (C) CC-CB   (D) CB-CC

44. A 100 pF capacitor has a maximum charging current of 150 μA. What is the slew rate?
(A) 1.5 V/μs   (B) 1.05 V/μs   (C) 0.15mV/s   (D) 10.5 mV/s

45. The output frequencies of bridge rectifier & half wave rectifier respectively are (f_{in} is input frequency)
(A) $2f_{in}$ & f_{in} (B) $2f_{in}$ & $2f_{in}$ (C) f_{in} & $2f_{in}$ (D) $2f_{in}$ & $f_{in}/2$

46. An ideal Op-Amp is an ideal
(A) voltage controlled current source   (B) voltage controlled voltage source
(C) current controlled current source   (D) current controlled voltage source

47. While biasing JFET if drain and source are interchanged, then
(A) device will work normally
(B) device will get damaged
(C) device will work but value of drain current will affected
(D) device will not operate at all

48. Two light bulbs are connected in series across a 120 V battery. Bulb 1 uses 40 W of power and Bulb 2 uses 20 W of power. If bulb 1 alone is connected to the 120 V source, then it will consume
(A) 90 W   (B) 80 W   (C) 60 W   (D) 180 W

49. A network consists of several inductances connected in parallel. The equivalent inductance of the network is given by
(A) the sum of the individual inductances.
(B) the reciprocal of the sum of the individual inductances.
(C) the sum of the reciprocals of individual inductances.
(D) the reciprocal of the sum of reciprocals of individual inductances.

50. A d.c. source has an open circuit voltage of 30 V and an internal resistance of 1.5Ω. A resistive load is connected to the source. Maximum power dissipated in the load is
(A) 300 W   (B) 150 W   (C) 45 W   (D) 20 W

51. At a particular instant, the R-phase voltage of a balanced 3-phase system is + 30 V, and the Y-phase voltage is – 90 V. The voltage of B-phase at that instant is
(A) + 120 V   (B) – 120 V   (C) – 60 V   (D) + 60 V

52. A coil of inductance 240 mH and resistance 75 Ω is connected in parallel with a capacitor across a 30 V, variable frequency supply. The current drawn by the circuit is found to be minimum when the supply frequency is 1 kHz. The approximate values of Q-factor and bandwidth are, respectively
(A) 40, 400 Hz (B) 10, 100 Hz (C) 20, 50 Hz (D) 50, 20 Hz

53. A series R-L-C circuit is connected to a d.c. source at t = 0. The transient voltage response across capacitor C shows no oscillations. Then,

(A) $\left(\dfrac{R}{2L}\right)^2 > \left(\dfrac{1}{LC}\right)$

(B) $\left(\dfrac{R}{2L}\right)^2 = \left(\dfrac{1}{LC}\right)$

(C) $\left(\dfrac{R}{2L}\right)^2 < \left(\dfrac{1}{LC}\right)$

(D) R = 0

54. A Two-Port Network is said to be symmetrical when the following equalities hold good
(A) $Z_{11} = Z_{22}$ and $Z_{12} = Z_{21}$ (B) $Z_{11} = Z_{22}$
(C) $Y_{12} = Y_{21}$ (D) $Y_{11} = Y_{22}$ and $Y_{12} = Y_{21}$

55. Referring to the circuits of Fig. 1 and Fig. 2, which of the following statements is correct with respect to V in the figures ?
(A) Circuit 1 is stable and Circuit 2 is unstable.
(B) Both circuits are stable.
(C) Both circuits are unstable.
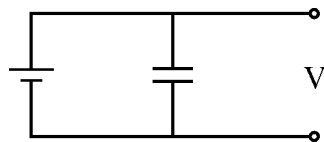(D) Circuit 1 is unstable and Circuit 2 is stable.
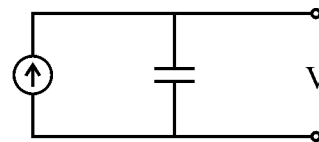
Fig. 1   **Fig. 2**

56. Fig.3 shows a signal flow graph. The transmittance from A to B is
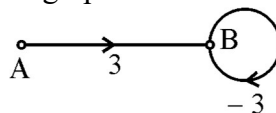
Fig. 3
(A) 3   (B) zero   (C) 4/3   (D) 3/4

57. The unit-step response of a system is given by $c(t) = 4 + 3t - 4e^{-t}$
The system has the fllowing poles and zeros
(A) one pole at origin, one pole at -1, and one zero at $-3/7$

(B) one pole at origin, one pole at $-\dfrac{3}{7}$, and one zero at -1

(C) one zero at -4, two poles at $-\dfrac{3}{7}$ and 4

(D) One zero at 4, two poles at $-\dfrac{3}{7}$ and 4

58. A type-2 system has zero steady-state error for
(A) Ramp input   (B) Parabolic input
(C) Both Ramp, and parabolic inputs   (D) Step input only

59. The closed-loop transfer function of a system is
$$\frac{10}{S[(S+3)(S+4)+K\,]}$$
The system is stable for
(A) Any value of K   (B) No value of K
(C) K = 10   (D) $3 < K < 12$

60. Which statement is INCORRECT in relation to NYQUIST and BODE analyses ?
(A) Number of closed-loop poles in the right-half S-plane can be determined using Nyquist Criterion.
(B) Bode analysis uses two plots, one for magnitude and another for phase angle.
(C) Nyquist analysis uses two plots, one for magnitude and another for phase angle.
(D) Relative stability can be assessed from both Nyquist and Bode analyses.

61. Which of the following is CORRECT with respect to a LAG-LEAD compensator ?
(A) It is similar to PI controller
(B) It acts as Band-pass filter
(C) It is Second-order system with one zero, and two poles
(D) It acts as a Band-reject filter

62. Whether a given point in the S-plane lies on the Root Locus of a system can be determined by
(A) Magnitude criterion   (B) Angle Criterion
(C) Both Magnitude and Angle Criteria   (D) Break-in and Break-away Criteria

63. The state equation of a system is $\dot{\overline{X}} = \overline{A}\,\overline{X} + \overline{B}\,\overline{U}$

Where $\overline{A} = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$. The state transition matrix is

(A) $\begin{bmatrix} te^{t} & 0 \\ e^{t} & e^{t} \end{bmatrix}$
(B) $\begin{bmatrix} te^{-t} & 0 \\ e^{-t} & e^{-t} \end{bmatrix}$
(C) $\begin{bmatrix} e^{-t} & 0 \\ te^{-t} & e^{-t} \end{bmatrix}$
(D) $\begin{bmatrix} e^{t} & 0 \\ te^{t} & e^{t} \end{bmatrix}$

64. The pointer of a moving coil ammeter deflects from zero and comes to rest at 2A marking. In the steady deflected position

(A) Deflecting torque T_D is zero.

(B) Control torque T_C is zero.

(C) Both T_D and T_C are zero. Damping Torque T_d is proportional to 2A.

(D) $T_d = 0$

65. The potential coil of a single phase dynamometer wattmeter has 4840 Ω resistance. Voltage across the load is 220 V. With the potential coil connected on the load side, the meter indicates 100 W. Approximate percentage error due to wattmeter connection is

(A) 11%   (B) 9%   (C) 1.1%   (D) 3%

66. The disc of a single phase Induction-type energy meter makes 60 revolutions in 6 minutes. Meter Constant is 1200 rev/kWh. Power consumption in the load is

(A) 1.2 kW   (B) 1 kW   (C) 600 W   (D) 500 W

67. Accurate measurement of very low resistances is possible with

(A) Megger   (B) Wheatstone Bridge

(C) Kelvin's Double Bridge   (D) Wagner's Earthing Device

68. Dielectric loss in a capacitor is best measured by

(A) Wien Bridge

(B) Schering Bridge

(C) Anderson Bridge

(D) Heaviside-Campbell Equal Ratio Bridge

69. The transducer with negative temperatue co-efficient of resistance is

(A) Thermistor   (B) Resistance Thermometer

(C) Strain Gauge   (D) Thermocouple

70. D : Distance between Screen and the centre of Deflection plates

l : Length of Deflection plates

l_d : Distance between the deflecting plates

E_a : Accelerating voltage

With the above notation, Deflection sensitivity of a CRT using electrostatic method of deflection is given by

(A) $\dfrac{2E_a l}{D l_d}$ (B) $\dfrac{Dl}{2l_d E_a}$ (C) $\dfrac{D l_d}{2l E_a}$ (D) $\dfrac{DE_a}{2l l_d}$

PART – B

71. A sum of ₹ 700 has to be used to give seven cash prizes to the students of a school for their overall academic performance. If each prize is ₹ 20 less than its preceding prize, then what is the least value of the prize?

    (A) ₹ 30　　　　(B) ₹ 40　　　　(C) ₹ 60　　　　(D) ₹ 80

72. In a class of 45 students, a boy is ranked 20th. When two boys joined, his rank was dropped by one. What is his new rank from the end ?

    (A) 25th　　　　(B) 26th　　　　(C) 27th　　　　(D) 28th
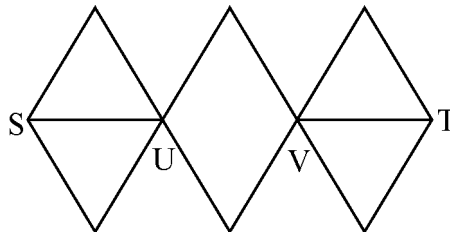
73. Three views of the cube are given below:
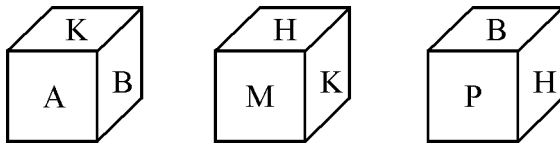
    What is letter opposite to A?

    (A) H　　　　(B) P　　　　(C) B　　　　(D) M

74. With reference to the figure given below, the number of different routes from S to T without retracing from U and/or V, is

    (A) 3　　　　(B) 6　　　　(C) 9　　　　(D) 18

75. Two sets of 4 consecutive positive integers have exactly one integer in common. The sum of the integers in the set with greater numbers is how much greater than the sum of the integers in the other set ?

    (A) 4　　　　(B) 7　　　　(C) 8　　　　(D) 12

76. X can do a work in 10 days and Y in 20 days. If they work on it together for 4 days, then the fraction of the work that is left is

(A) 1/5   (B) 2/5   (C) 3/5   (D) 4/5

77. You're giving someone verbal feedback about some work they have completed which isn't up to standard. What should you do ?

(A) Point out everything that they did wrong

(B) Base your feedback on what you have heard from others

(C) Criticize them for their poor work

(D) Suggest where improvements can be made and agree on a plan

78. Which of the following will NOT help you to be more persuasive ?

(A) Mirror body language and tone

(B) Use words that the other person agrees with

(C) Talk about your own interests and goals

(D) Make your aims appear to put the other person at an advantage

79. 5, 12, 17, 29, 46, 75, 121, __?__

(A) 185   (B) 196

(C) 192   (D) 188

80.

(A)   (B)

(C)   (D)

81. Verve: Enthusiasm

(A) Loyalty : Duplicity   (B) Devotion : Reverence

(C) Intensity : Colour   (D) Eminence : Anonymity

82. Out of the natural numbers upto 127, how many are even numbers ?

(A) 62

(B) 63

(C) 64

(D) 65

83. Nurse Kemp has worked more night shifts in a row than Nurse Rogers, who has worked five. Nurse Miller has worked fifteen night shifts in a row, more than Nurses Kemp and Rogers combined. Nurse Calvin has worked eight night shifts in a row, less than Nurse Kemp. How many night shifts in a row has Nurse Kemp worked?

(A) Eight

(B) Nine

(C) Ten

(D) Eleven

84. Find the odd number among the following :

(A) 7

(B) 11

(C) 27

(D) 29

85. The school principal has received complaints from parents about bullying in the school yard during recess. He wants to investigate and end this situation as soon as possible, so he has asked the recess aides to watch closely. Which situation should the recess aides report to the principal ?

(A) A girl is sitting glumly on a bench reading a book and not interacting with her peers.

(B) Four girls are surrounding another girl and seem to have possession of her backpack.

(C) Two boys are playing a one-on-one game of basketball and are arguing over the last basket scored.

(D) Three boys are huddled over a handheld video game, which isn't supposed to be on school grounds.

86. 'n' is a natural number. If n^5 is odd, which of the following is true ?

(I) n is odd.

(II) n^3 is odd.

(III) n^4 is even.

(A) I only

(B) II only

(C) III only

(D) I and II

87. What will be the next number in the sequence 6, 11, 21, 36, 56, ___ ?

(A) 76

(B) 72

(C) 81

(D) 91

88. Here are some words translated from an artificial language.
dionot means oak tree

blyonot means oak leaf

blycrin means maple leaf

Which word could mean "maple syrup"?

(A) blymuth   (B) hupponot   (C) patricrin   (D) crinweel

89. A is B's sister. C is B's mother. D is C's father. E is D's mother. Then, how is A related to D ?

(A) Grandfather   (B) Grandmother   (C) Daughter   (D) Granddaughter

90. Two bus tickets from city A to B and three tickets from city A to C cost ₹ 77 but three tickets from city A to B and two tickets from city A to C cost ₹ 73. What are the fares for cities B and C from A?

(A) ₹ 4, ₹ 23   (B) ₹ 13, ₹ 17   (C) ₹ 15, ₹ 14   (D) ₹ 17, ₹ 13

91. There are six persons A, B, C, D, E and F. C is the brother of F. B is the brother of E's husband. D is the father of A and grandfather of F. There are two fathers, three brothers and a mother in the group. Who is the mother?

(A) A   (B) B   (C) C   (D) E

92. If Z = 52 and ACT = 48, then BAT will be equal to

(A) 39   (B) 41   (C) 44   (D) 46

93. A tailor had a number of shirt pieces to cut from a roll of fabric. He cuts each roll of equal length into 10 pieces. He cuts at the rate of 45 per minute. How many rolls would be cut in 24 minutes ?

(A) 32 rolls   (B) 54 rolls   (C) 108 rolls   (D) 120 rolls

94. 4 men & 6 women can complete a work in 8 days, while 3 men and 7 women can complete it in 10 days. In how many days will 10 women complete it ?

(A) 35 days   (B) 40 days   (C) 30 days   (D) 25 days

95. In a class of 100 students, 50 students passed in Mathematics and 70 passed in English, 5 students failed in both Mathematics and English. How many students passed in both the subjects ?

(A) 50   (B) 40   (C) 35   (D) 25

96. A man on tour travels first 160 km at 64 km/hr and the next 160 km at 80 km/hr. The average speed for the first 320 km of the tour is

(A) 71.11 km/hr   (B) 36 km/hr   (C) 71 km/hr   (D) 36.33 km/hr

97. The length of a rectangular field is thrice its breadth. If the cost of cultivating the field at ₹ 367.20 per square metre is ₹ 27,540, then what is the perimeter of the rectangle ?

(A) 47 m   (B) 39 m   (C) 52 m   (D) 40 m

98. In an examination, a student was asked to find 3/14 of a certain number. By mistake, he found 3/4 of it. His answer was 150 more than the correct answer. Find the given number.

(A) 190   (B) 250   (C) 280   (D) 350

99. A cube with all the sides painted was divided into small cubes of equal measurement. The side of a small cube is exactly one fourth as that of the big cube. Therefore, the number of small cubes with only one side painted is

(A) 64   (B) 36   (C) 24   (D) 12

100. Shyam walks 5 km towards East and then turns left and walks 6 km. Again he turns right and walks 9 km. Finally he turns to his right and walks 6 km. How far is he from the starting point ?

(A) 26 km   (B) 21 km   (C) 14 km   (D) 9 km

_____

SPACE FOR ROUGH WORK