PSC Assistant Professor In Electrical And Electronics Engineering - Technical Education - Engineering Colleges Examination
Previous Year Question Paper

Exam Name: ***Assistant Professor In Electrical And Electronics Engineering - Technical Education - Engineering Colleges***

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Medium of Questions: English

063/2016

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Article 56 of Indian constitution declares :
   (A) Election of the President
   (B) Manner of election of the president
   (C) Qualifications for election as president
   (D) Term of office of president

2. Among the following which is not a sub clause of Article 19 :
   (A) Right to establish and maintain institutions for religious and charitable purposes
   (B) Right to form associations
   (C) Right to assemble peaceably and without arms
   (D) Freedom of speech and expression

3. According to Article 315, Public Service Commission is :
   (A) A statutory body
   (B) A governing body for recruitments
   (C) An independent expert body
   (D) A quasi-government body with judicial powers

4. A Proclamation of Emergency issued under clause (1) of article 352 may be varied or revoked by :
   (A) The impeachment of the president
   (B) A subsequent proclamation
   (C) A vote on account in the houses of parliament
   (D) Expiration of a period of 15 days from the date of proclamation

5. The article which states that the president shall appoint a person who is qualified to be appointed a judge of Supreme Court to be Attorney-General for India.
   (A) Article 75 (B) Article 76
   (C) Article 77 (D) Article 78

6. The length of Tran-Siberian rail road :
   (A) 8289 km (B) 9289 km
   (C) 8689 km (D) 9689 km

7. Mahatma Gandhi Sethu is built across the river :
   (A) Ganga (B) Yamuna
   (C) Sarayu (D) Brahmaputra

8. What is the height of the highest viaduct bridge in Asia which is built in Konkan rail road?
   (A) 46 meters (B) 57 meters
   (C) 64 meters (D) 79 meters

9. Light absorbing organic carbon which causes decoulration of Taj is also known as :
   (A) Brown carbon (B) Black carbon
   (C) Blue carbon (D) Grey carbon

10. The date on which Malayala Manorama started publication as a weekly :
   (A) January 22, 1888 (B) February 22, 1889
   (C) March 22,1890 (D) April 22, 1891

11. The place where world's first bit coin ATM was set up :
   (A) New York (B) Dublin
   (C) Toronto (D) Vancouver

12. The deepest immersed intercontinental tube tunnel rail road is :
   (A) Madrid (B) Prague
   (C) Texas (D) Marmaray

13. What do you mean by 'boat people problem'?
   (A) Refugee problem (B) Economic melt-down
   (C) Political instability (D) Terrorism

14. What is the old name of INS Vikramaditya?
   (A) Adm. Rustov (B) Adm. Pavlov
   (C) Adm. Gorshghov (D) Adm. Vagogue

15. The head office of World Tourism Organisation is situated at :

(A) Geneva (B) New York

(C) Madrid (D) Manchester

16. The world mothertongue day is observed on :

(A) March 21 (B) February 21

(C) April 21 (D) May 21

17. Who formed the first trade union movement – Travancore Labour Association in Kerala?

(A) P. Krishnapillai (B) R. Sugathan

(C) T.V. Thomas (D) P.K. Bava

18. The first book written by E.M.S. Namboodirippad is :

(A) A short history of the peasant movement in Kerala

(B) Thirinhunokkumbol

(C) Gandhiyum Gandhisavum

(D) Jawaharlal Nehru

19. The name of committee set up in 1995 to study the Prasar Bharathi Act.

(A) Sengupta committee (B) B.G. Verghese committee

(C) Joshi committee (D) Justice Rajadhyaksha committee

20. The date on which the Akashavani-Doordarshan DTH service came into being :

(A) 16th January 2004 (B) 16th December 2004

(C) 16th November 2004 (D) 16th October 2004

21. Let A be a 3×3 matrix with characteristic polynomial $p(\lambda) = \lambda(\lambda - 1)(\lambda - 2)$. Which of the following statement is wrong :

(A) A is not invertible

(B) There are three eigen vectors V_1, V_2, V_3 which form as eigen basis of R^3

(C) Each eigen space of A is one-dimensional

(D) The linear system $(A - 3I)x = B$ has a unique solution for each B in R^3

22. The maximum value of $(xy)^5$ on the ellipse $\frac{x^2}{4} + y^2 = 1$ occurs at a point (x, y) for which y^2 is equal to :

(A) $\frac{\sqrt{2}}{3}$ (B) $\frac{1}{2}$

(C) $\frac{2}{3}$ (D) $\frac{5}{4}$

23. Which of the following is the Laplace transform of $f(t) = \begin{cases} 1, & 0 \le t \le 2 \\ t^2 - 4t + 4, & t > 2 \end{cases}$

(A) $\frac{2e^{-2s}}{s^3}$ (B) $\frac{1 - e^{-2s}}{s} + \frac{2e^{-2s}}{s^3}$

(C) $\frac{e^{-2s}}{s} + \frac{2 - 2e^{-2s}}{s^3}$ (D) $\frac{2 - 2e^{-2s}}{s^3}$

24. What is the image of $|z| < 1$ under the tranformation $w = \frac{i - z}{i + z}$?

(A) right half plane (B) upper half plane

(C) right half of $|w| < 1$ (D) $|w| < 1$

25. If $\vec{u}$ and $\vec{v}$ are irrotational vectors which of the following is true?

(A) $\vec{u} \cdot \vec{v}$ is irrotational (B) $\vec{u} \times \vec{v}$ is irrotational

(C) $\vec{u} \times \vec{v}$ is solenoidal (D) $\vec{u} \times \vec{v} = \vec{0}$

26. When a body of mass moment of inertia I about a given axis is rotated about that axis with an angular velocity ω, then the kinetic energy of rotation is :

(A) $I\omega$ (B) $I\omega^2$

(C) $0.5\, I\omega$ (D) $0.5\, I\omega^2$

27. The resultant of two forces each equal to 2 N and acting at right angles is :

(A) $2/\sqrt{2}$ (B) $\sqrt{2}/2$

(C) $2\sqrt{2}$ (D) $\sqrt{2}$

28. A ridge formed by the intersection of two sloped surfaces having an exterior angle greater than 180° is called :

(A) gable (B) hip

(C) verge (D) template

29. If magnetic bearing of sun at noon at a place in southern hemisphere is 150°, then magnetic declination at that place is :

(A) 30° E (B) 30° W

(C) 20° E (D) 20° W

30. When (H) is the difference in heights between the extremities of a chain length (L), then the correction for slope required is :

(A) H / L (B) H^2 / L

(C) $H^2 / 2L$ (D) $H / 2L$

31. An engine of 105 kW capacity requires 10 kW to start the engine. Its mechanical efficiency is :

(A) 87.2% (B) 91.3%

(C) 85.2% (D) 93.1%

32. In the vapour compression cycle the condition of refrigerant is superheated vapour :

(A) before passing through the condenser

(B) after passing through the condenser

(C) after passing through the expansion valve

(D) before passing through the expansion valve

33. Specific speed of a turbine depends upon :

(A) speed and head (B) speed, discharge and head

(C) speed power and discharge (D) speed, power and head

34. Which of the following manufacturing processes be likely to produce the strongest parts?

(A) investment casting (B) die casting

(C) forging (D) powder metallurgy

35. Climb milling is preferred while machining since :

(A) the chip thickness increases gradually

(B) it enable the cutter to dig in and start the cut

(C) better surface finish can be obtained

(D) the specific power consumption is reduced

36. Two resistors of 80 Ω and 120 Ω are connected in parallel. If the current through 80 Ω resistor is 7 A, calculate the total current flowing through the circuit :

(A) 5.6 A (B) 12.6 A

(C) 11.6 A (D) 14.6 A

37. The unit of magneto motive force is :

(A) Weber (B) Ampere/metre

(C) Henry (D) Ampere-turn/weber

38. Three equal impedances are first connected in star across a balanced three phase supply. If connected in delta across the same supply :

(A) Phase current will be tripled

(B) Phase current will be doubled

(C) Line current will become one third

(D) Power consumed will increase three fold

39. The power factor of an alternator is determined by its :

(A) Speed (B) Load

(C) Excitation (D) Prime mover

40. A synchronous machine is called doubly excited machine because :

(A) It can be over excited

(B) It has two sets of rotor poles

(C) Both its rotor and stator are excited

(D) It needs twice the normal exciting current

41. Temperature compensation of a 18 V zener diode can be achieved by connecting it in :

(A) Parallel with forward biased Si diodes

(B) Series with reverse biased Si diodes

(C) Series with forward biased Si diodes

(D) Parallel with reverse biased Si diodes

42. The transformer utilization factor of a full wave rectifier is :

(A) 0.287 (B) 0.693

(C) 0.487 (D) 0.675

43. Identify the wrong statement regarding the Miller capacitance of a CE amplifier :

(A) It increases the input capacitance

(B) It decreases the input capacitance

(C) It decreases the gain at high frequencies

(D) It increases the level of output capacitance

44. An AM transmitter has an rms antenna current of 11 A when unmodulated and 13 A when sinusoidally modulated. The modulation index is :

(A) 0.79 (B) 0.98

(C) 0.33 (D) 0.89

45. In the visual display on the CRT screen, the sweep voltage causes the spot to move about the screen :

(A) horizontally from left to right at a constant velocity

(B) vertically from top to bottom with constant velocity

(C) horizontally from left to right with linearly increasing velocity

(D) vertically from top to bottom with linearly increasing velocity

46. Central Processing Unit is a combination of :

(A) Control and storage (B) Control and output unit

(C) Arithmetic logic and input unit (D) Arithmetic logic and control unit

47. Which of the following memories needs refreshing?

(A) SRAM (B) DRAM

(C) ROM (D) All of above

48. Recursion is a process in which a function calls :

(A) itself (B) another function

(C) main( ) function (D) none of the above

49. What will be the final values of x and y?

```
void main ( )
{
        int x = 1, y = 1;
        clrscr( );
        do while (x<=7)
        {
        x++, y++;
        }
        while (y<=5);
        printf("\n x = %d y = %d", x, y);
}
```

(A) x = 6 y = 6
(B) x = 8 y = 6
(C) x = 8 y = 8
(D) none of the above

50. What will be the output of the following program?

```
void main( )
{
        char x = 'd';
        clrscr( );
        switch (x)
        {
        case 'b'
        puts( "0 1 001");
        break;
        default :
        puts ("3 2 1");
        break;
        case 'R' :
        puts ("I II III");
    }
}
```

(A) 0 1 001
(B) 3 2 1
(C) I II III
(D) none of the above

51. Nodal analysis is based on :

(A) KVL

(B) KCL

(C) Faradays laws of electromagnetic induction

(D) Biot-Savart's law

52. Which is incorrect statement in case of series resonance condition :

(A) Impedance, Z is minimum

(B) Current, I is maximum

(C) Inductive and Capacitive reactances are equal $(X_L = X_C)$

(D) The resonant frequency, $f = \frac{1}{2\pi\sqrt{LCR}} Hz$

53. When maximum power is transferred to the load, the efficiency will be :

(A) Zero (B) 100%

(C) 50% (D) Above 95%, but below 100%

54. Superposition theorem is applicable to :

(A) Linear system (B) Non-linear system

(C) Both linear and non-linear systems (D) None of the above

55. Potential of a sphere is :

(A) $Q/4\pi\varepsilon_0 r$ (B) $Q/4\pi\varepsilon_0 r^2$

(C) $Q^2/4\pi\varepsilon_0 r$ (D) $Q^2/4\pi\varepsilon_0 r^2$

56. A, B, C, D represents the transmission parameters of a two-port network. For the network to be reciprocal the condition is :

(A) $AB - CD = 0$ (B) $AB - CD = 1$

(C) $AD - BC = 0$ (D) $AD - BC = 1$

57. Select the correct statement in connection with symmetrical components :

(A) Zero sequence components are three vectors of equal magnitude and are displaced by 120° phase with each other

(B) Positive sequence components are three vectors of equal magnitude displaced in phase by 120° and has the phase sequence opposite to that of the original vectors

(C) Negative sequence components are three vectors of equal magnitude displaced in phase by 120° and has the same phase sequence as that of the original vectors

(D) None of the above

58. If two conductors carry current in opposite directions there will be :

(A) No force acting between them

(B) A force of attraction between the conductors

(C) A force of repulsion between the conductors

(D) None of the above

59. Ohm's law in point form in field theory can be expressed as :

(A) $V = IR$ (B) $J = \sigma E$

(C) $J = E/\sigma$ (D) $R = \rho l/A$

60. In a dielectric medium :

(A) displacement current is negligible

(B) displacement current is equal to conduction current

(C) displacement current is higher than conduction current

(D) displacement current is lower than conduction current

61. The condition for maximum efficiency in a single phase transformer is :

(A) Hysteresis Loss = Eddy current loss

(B) Core loss = Cu loss

(C) Number of primary turns = Number of secondary turns

(D) Primary Loss = Secondary loss

62. A 4 pole, wave wound DC generator has 144 slots with 3 conductors per slot. if the speed of machine is 1200 rpm, and the working flux is 0.025 Wb/pole, the generated emf will be :

(A) 108 V (B) 216 V

(C) 432 V (D) 864 V

63. Select the correct statement :

(A) 3-point starter is used for improving the efficiency of DC motor

(B) DC series motor shall be started without any load

(C) Equalizer rings are used for reducing the armature reaction

(D) Lap winding is used for low-voltage, high-current generators

64. A 4 pole, induction motor is running at 1440 rpm, when standard KSEB supply is given. The sip of the machine is :

(A) 4% (B) 1%

(C) 0% (D) 100%

65. The best indirect method to find the regulation of an alternator is :

(A) EMF method (B) MMF method

(C) ZPF method (D) Slip test

66. Which of the following is not the condition for synchronizing an alternator with the grid?

(A) Phase sequence of the alternator is required to be same as that of the grid

(B) Voltage magnitude of both the alternator and grid to be same

(C) Frequency to be same on both sides

(D) Power rating to be same on both sides

67. The maximum starting torque is developed in an induction motor :

(A) When rotor resistance equals rotor reactance

(B) When slip of the machine is unity

(C) When hunting windings are used

(D) When slip rings are used

68. Universal motor is :

(A) DC series motor
(B) AC series motor
(C) Synchronous motor
(D) Induction motor

69. Crawling phenomenon is associated with :

(A) Universal motor
(B) Synchronous motor
(C) Induction motor
(D) Alternator

70. Select the incorrect statement :

(A) Synchronous motor runs only at synchronous speed
(B) Under excited synchronous motor is also known as synchronous condenser
(C) Single phase induction motor is not a self starting machine
(D) Star-Delta starter is used to start a three phase induction motor

71. Diversity Factor is defined as :

(A) Maximum demand of consumers / Average demand
(B) Sum of maximum demands of consumers / maximum demand of consumer
(C) Connected load / Maximum demand
(D) Average demand / Maximum demand

72. The fuel inputs per hour for plants 1 and 2 are given as :

$F1 = 0.2P_1^2 + 40P_1 + 120$

$F2 = 0.25P_2^2 + 30P_2 + 150$

The maximum and minimum loading on each unit is 100 *MW* and 25 *MW*. The demand is 180 *MW*. The economic operating schedule is

(A) $P_1 = 120MW,\ P_2 = 60\,MW$
(B) $P_1 = 30MW,\ P_2 = 150\,MW$
(C) $P_1 = 89\ MW,\ P_2 = 91\,MW$
(D) $P_1 = 100MW,\ P_2 = 25\,MW$

73. Load flow solution, the quantities normally specified at a voltage controlled bus are :

(A) P and $|V|$ (B) P and Q

(C) Q and $|V|$ (D) P and δ

74. Mho relay is used for the protection of :

(A) Power transformers (B) Alternators

(C) Distribution Transformers (D) Long transmission lines

75. The p.u. value of an alternator corresponding to base values 13.2 kV and 30 MVA is 0.2 p.u. The p.u. value for the base values 13.8 kV and 50 MVA will be :

(A) 0.306 p.u. (B) 0.33 p.u.

(C) 0.2 p.u. (D) 0.318 p.u.

76. The receiving end voltage can be higher than sending end voltage due to :

(A) Hall effect (B) Proximity effect

(C) Corona effect (D) Ferranti effect

77. The coefficient of reflection for current for an open ended line is :

(A) Zero (B) 1.0

(C) –1.0 (D) Infinity

78. The positive sequence component of voltage at the point of fault is zero when it is a :

(A) 3 phase fault (B) L-L fault

(C) L-G fault (D) L-L-G fault

79. The principle of operation of LVDT is based on variation of :

(A) Resistance (B) Reluctance

(C) Self inductance (D) Mutual inductance

80. In the measurement of power by two wattmeter method in three phase circuit, when one of the wattmeter shows zero reading, it can be inferred that :

(A) Power factor of the circuit is zero

(B) Power factor of the circuit is 0.5 lagging

(C) Power factor of the circuit is unity

(D) Zero reading wattmeter is faulty

81. The condition for stability of second order system is that the two system poles should be :

(A) located at the origin in the s-plane

(B) located in the imaginary axis of s-plane

(C) located in the right half of s-plane

(D) located in the left half of s-plane

82. Select the incorrect relation :

(A) $T_P = \frac{\pi}{\omega_n\sqrt{1-\zeta^2}}$ (B) $\zeta = GM/100$

(C) Maximum overshoot $= 100e^{\frac{-\pi\zeta}{\sqrt{1-\zeta^2}}}\%$ (D) $T_s = \frac{4}{\zeta\omega_n}$

83. A unit step applied to the closed-loop system, $\frac{K}{s^2+2s+K}$ with $K=1$, will show :

(A) Critically damped response (B) Under damped response

(C) Over damped response (D) Undamped response

84. The characteristics equation of the system is obtained as, $\Delta(s) = s(s+3)(s+10)+K$. The range of K for stability is :

(A) $K > 0$ (B) $0 < K < 390$

(C) $0 < K \leq 390$ (D) $K > 390$

85. For a system to be stable :

(A) Both GM and PM should be zero

(B) Both GM and PM should be negative

(C) Both GM and PM should be positive

(D) GM should be infinite and PM should be zero

86. The system represented by $\begin{bmatrix}\dot{x}_1\\ \dot{x}_2\end{bmatrix} = \begin{bmatrix}-0.5 & 0\\ 0 & -2\end{bmatrix}\begin{bmatrix}x_1\\ x_2\end{bmatrix} + \begin{bmatrix}0\\ 1\end{bmatrix}u;\ y = \begin{bmatrix}0 & 1\end{bmatrix}\begin{bmatrix}x_1\\ x_2\end{bmatrix}$ is :

(A) Controllable and Observable (B) Controllable but Unobservable

(C) Uncontrollable and Unobservable (D) Uncontrollable but Observable

87. A Non-linear system is characterized by :

(A) Multiple equilibrium points
(B) Non generation of limit cycle
(C) Independed of input signal
(D) Independed of initial conditions

88. Choose the incorrect statement with sampling process :

(A) Sampling frequency should be at least 2 times the highest frequency in the signal
(B) Sampling introduces approximately a delay of Ts/2
(C) Pre-filters are used before sampling of the signal to be processed
(D) Increase in the sampling frequency increases the stability margin

89. PID controller introduces :

(A) One pole and one zero
(B) One pole and two zeros
(C) Two poles and one zero
(D) No poles and zeros

90. The effect of addition of a 'zero' to the system is :

(A) To push the root-locus towards the right side of s-plane
(B) To reduce the gain of the system
(C) To introduce a delay in the system response
(D) To reduce the stable range of operation of the system

91. Positive feedback is used in :

(A) Furnace temperature control
(B) Liquid flow control
(C) Speed control of motor
(D) Phase shift oscillator

92. Tunnel diode :

(A) is a reverse recovery diode
(B) is a power diode
(C) has light doping
(D) has heavy doping

93. The α and β of a transistor are related to each other as :

(A) $\beta = \frac{\alpha}{1+\alpha}$
(B) $\beta = \frac{1+\alpha}{1-\alpha}$
(C) $\alpha = \frac{\beta}{1+\beta}$
(D) $\alpha = \frac{1+\beta}{1-\beta}$

94. Two amplifiers each of bandwidth 10 kHz are cascaded. The overall bandwidth becomes :

(A) 5 kHz (B) 6.4 kHz

(C) 10 kHz (D) 20 kHz

95. An op-amp has a common mode gain of 0.01 and a differential mode gain of 10^5. Its CMRR would be :

(A) 10^{-7} (B) 10^{-3}

(C) 10^3 (D) 10^7

96. The 'Snubber' circuit is used in thyristor circuits for :

(A) Triggering (B) dv/dt protection

(C) di/dt protection (D) Bypass high frequency noise

97. A power chopper converts :

(A) DC to DC (B) DC to AC

(C) AC to DC (D) AC to AC

98. What is the simplified form of the Boolean expression? $T = (X + Y)(X + \overline{Y})(\overline{X} + Y)$:

(A) XY (B) $\overline{X}Y$

(C) $\overline{XY}$ (D) $X\overline{Y}$

99. Which of the following is used as latch?

(A) J-K Master-Slave (B) R-S flip-flop

(C) D flip-flop (D) T flip-flop

100. Which interrupt has the highest priority?

(A) RST 7.5 (B) RST 7

(C) RST 6.5 (D) INTR