अधिव्याख्याता, विद्युत अभियांत्रिकी, शासकीय तंत्र निकेत[illegible] अ

परीक्षा दि. 23 [illegible] 2014.

A

2014 CODE : V

प्रश्नपुस्तिका क्रमांक

प्रश्नपुस्तिका BOOKLET NO.

चाळणी परीक्षा

वेळ : 3 (तीन) तास

विद्युत अभियांत्रिकी

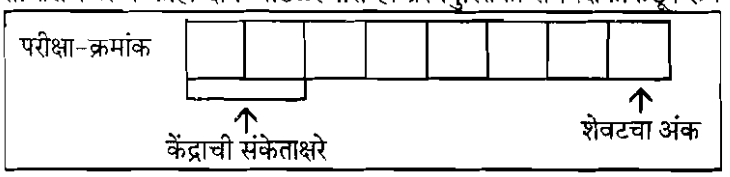
एकूण प्रश्न : 80

एकूण गुण : 200

सूचना

(1) सदर प्रश्नपुस्तिकेत 80 अनिवार्य प्रश्न आहेत. उमेदवारांनी प्रश्नांची उत्तरे लिहिण्यास सुरुवात करण्यापूर्वी या प्रश्नपुस्तिकेत सर्व प्रश्न आहेत किंवा नाहीत याची खात्री करून घ्यावी. असा तसेच अन्य काही दोष आढळल्यास ही प्रश्नपुस्तिका समवेक्षकांकडून लगेच बदलून घ्यावी.

(2) आपला परीक्षा-क्रमांक ह्या चौकोनांत **न विसरता बॉलपेनने** लिहावा.



(3) वर छापलेला प्रश्नपुस्तिका क्रमांक तुमच्या उत्तरपत्रिकेवर विशिष्ट जागी उत्तरपत्रिकेवरील सूचनेप्रमाणे **न विसरता नमूद करावा.**

(4) या प्रश्नपुस्तिकेतील प्रत्येक प्रश्नाला 4 पर्यायी उत्तरे सुचविली असून त्यांना 1, 2, 3 आणि 4 असे क्रमांक दिलेले आहेत. त्या चार उत्तरांपैकी सर्वात योग्य उत्तराचा क्रमांक उत्तरपत्रिकेवरील सूचनेप्रमाणे तुमच्या उत्तरपत्रिकेवर नमूद करावा. अशा प्रकारे उत्तरपत्रिकेवर उत्तरक्रमांक नमूद करताना तो संबंधित प्रश्नक्रमांकासमोर छायांकित करून दर्शविला जाईल याची काळजी घ्यावी. **ह्याकरिता फक्त काळ्या शाईचे बॉलपेन वापरावे, पेन्सिल वा शाईचे पेन वापरू नये.**

(5) सर्व प्रश्नांना समान गुण आहेत. यास्तव सर्व प्रश्नांची उत्तरे द्यावीत. घाईमुळे चुका होणार नाहीत याची दक्षता घेऊनच शक्य तितक्या वेगाने प्रश्न सोडवावेत. क्रमाने प्रश्न सोडविणे श्रेयस्कर आहे पण **एखादा प्रश्न कठीण वाटल्यास त्यावर वेळ न घालविता पुढील प्रश्नाकडे वळावे.** अशा प्रकारे शेवटच्या प्रश्नापर्यंत पोहोचल्यानंतर वेळ शिल्लक राहिल्यास कठीण म्हणून वगळलेल्या प्रश्नांकडे परतणे सोईस्कर ठरेल.

(6) उत्तरपत्रिकेत एकदा नमूद केलेले उत्तर खोडता येणार नाही. नमूद केलेले उत्तर खोडून नव्याने उत्तर दिल्यास ते तपासले जाणार नाही.

(7) **प्रस्तुत परीक्षेच्या उत्तरपत्रिकांचे मूल्यांकन करताना उमेदवाराच्या उत्तरपत्रिकेतील योग्य उत्तरांनाच गुण दिले जातील. तसेच ''उमेदवाराने वस्तुनिष्ठ बहुपर्यायी स्वरूपाच्या प्रश्नांची दिलेल्या चार पर्यायापैकी सर्वात योग्य उत्तरेच उत्तरपत्रिकेत नमूद करावीत. अन्यथा त्यांच्या उत्तरपत्रिकेत सोडविलेल्या प्रत्येक चार चुकीच्या उत्तरांसाठी एका प्रश्नाचे गुण वजा करण्यात येतील''.**

पर्यवेक्षकांच्या सूचनेविना हे सील उघडू नये

ताकीद

ह्या प्रश्नपत्रिकेसाठी आयोगाने विहित केलेली वेळ संपेपर्यंत ही प्रश्नपुस्तिका आयोगाची मालमत्ता असून ती परीक्षाकक्षात उमेदवाराला परीक्षेसाठी वापरण्यास देण्यात येत आहे. ही वेळ संपेपर्यंत सदर प्रश्नपुस्तिकेची प्रत/प्रती, किंवा सदर प्रश्नपुस्तिकेतील काही आशय कोणत्याही स्वरूपात प्रत्यक्ष वा अप्रत्यक्षपणे कोणत्याही व्यक्तीस पुरविणे, तसेच प्रसिद्ध करणे हा गुन्हा असून अशी कृती करणाऱ्या व्यक्तीवर शासनाने जारी केलेल्या ''परीक्षांमध्ये होणाऱ्या गैरप्रकारांना प्रतिबंध करण्याबाबतचा अधिनियम-82'' यातील तरतुदीनुसार तसेच प्रचलित कायद्याच्या तरतुदीनुसार कारवाई करण्यात येईल व दोषी व्यक्ती कमाल एक वर्षाच्या कारावासाच्या आणि/किंवा रुपये एक हजार रकमेच्या दंडाच्या शिक्षेस पात्र होईल.

तसेच ह्या प्रश्नपत्रिकेसाठी विहित केलेली वेळ संपण्याआधी ही प्रश्नपुस्तिका अनधिकृतपणे बाळगणे हा सुद्धा गुन्हा असून तसे करणारी व्यक्ती आयोगाच्या कर्मचारीवृंदापैकी, तसेच परीक्षेच्या पर्यवेक्षकीयवृंदापैकी असली तरीही अशा व्यक्तीविरूद्ध उक्त अधिनियमानुसार कारवाई करण्यात येईल व दोषी व्यक्ती शिक्षेस पात्र होईल.

पुढील सूचना प्रश्नपुस्तिकेच्या अंतिम पृष्ठावर पहा

कच्च्या कामासाठी जागा / SPACE FOR ROUGH WORK

1. A two port network has transmission parameters, the input impedance of the netw port 1 will be :

(1) AD/BC (2) A/C (3) AB/DC (4) D/C

---

2. The synchronous speed of an 8 pole induction motor supplied power from a 50 Hz source will be :

(1) 1500 rpm (2) 900 rpm (3) 750 rpm (4) 375 rpm

---

3. A generating station has maximum demand of 25 MW, load factor of 60%, a plant capacity factor of 50% and plant use factor of 72%. What is the reserve capacity of plant if the plant, while running as per the schedule, was fully loaded ?

(1) 10 MW (2) 15 MW (3) 2 MW (4) 5 MW

---

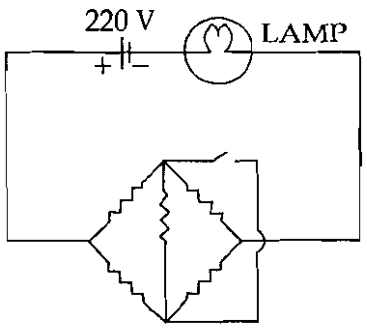
4. For existence of Fourier transform of $f(t)$ the necessary and sufficient condition is :

(1) $\int_{-\infty}^{0} f(t)dt < \infty$ (2) $\int_{-\infty}^{\infty} f(t)dt < \infty$

(3) $\int_{-\infty}^{\infty} f(t)dt = 0$ (4) $\int_{-\infty}^{\infty} |f(t)|dt < \infty$

---

5. All the resistances in the circuit given are of R Ω each. The switch is initially open. What happens to the lamp's intensity when the switch is closed ?



(1) Increases (2) Remains the same

(3) Decreases (4) Answer depends on the value of R

SPACE FOR ROUGH WORK

P.T.O.

6. The slew rate of an op-amp is 0.5 V/μs. The maximum frequency of a sinusoidal input 2 V_{rms} that can be handled without excessive distortion is :
(1) 3 kHz (2) 30 kHz (3) 200 kHz (4) 2 MHz

7. A shunt generator produces 450 amp at 230 V. The resistances of the shunt fields and armature are 50 ohm and 0.025 ohm respectively. The armature voltage drop will be :
(1) 11.39 V (2) 22.7 V (3) 31.6 V (4) 38.4 V

8. Sensor outputs destined for a digital computer system must first be processed by :
(1) D/A (2) A/D (3) MPU (4) PLD

9. In Scott connected transformer the number of primary and teaser turns respectively are :
(1) N, $\left(2/\sqrt{3}\right)$N (2) N/2, N (3) $\left(\sqrt{3}/2\right)$ N, N (4) N, $\left(\sqrt{3}/2\right)$ N

10. A resistance of 12 ohms and inductance of 0.15 H and a capacitance of 1.0 microfarad are connected in series across a 100 V, 50 Hz supply. The power factor of the circuit will be :
(1) unity (2) zero (3) leading (4) lagging

11. A switch is connected in series with RL series circuit, a switch is closed at t = 0. The circuit was initially relaxed. Which of the following sources of v(t) will produce maximum current at $t=0+$?
(1) unit step (2) unit ramp (3) unit impulse (4) exponential

12. If the vector field $\overline{F}=(x+2y+az)i+(-2x-3y-z)j+(4x-y+2z)k$ is irrotational then the value of a is :
(1) -4 (2) 3 (3) -3 (4) 4

13. An open loop system represented by the transfer function $G(s)=(s-1)/(s+2)(s+3)$ is :
(1) stable and of the minimum phase type
(2) stable and of the non-minimum phase type
(3) unstable and of the minimum phase type
(4) unstable and of the non-minimum phase type

14. The maximum value of mutual inductance of two inductively coupled coils with self inductance $L_1=49$ H and $L_2=81$ H is :
(1) 130 mH (2) 63 mH (3) 32 mH (4) 2658 mH

SPACE FOR ROUGH WORK

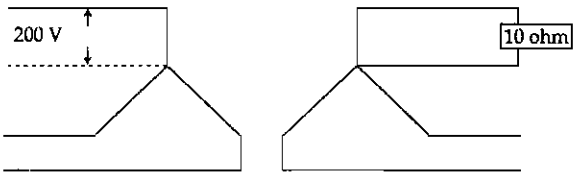
15. In an alternator, if the winding is short pitched by 50 electrical degrees, its pitch factor will be :

(1) 1.6 (2) 0.866 (3) 0.78 (4) 0.50

16. If the secondary of a 1 : 10 step up transformer is connected to the primary of a 1 : 5 step up transformer, the total transformation ratio will be :

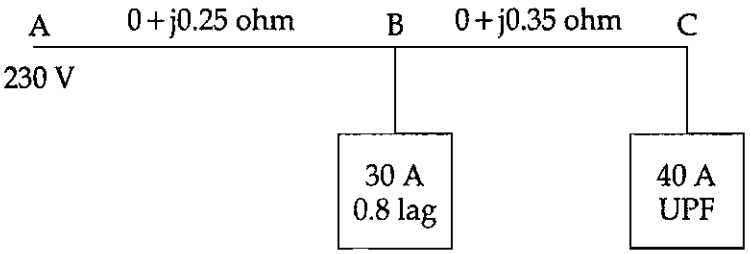
(1) 2500 (2) 30 (3) 15 (4) 50

17. The voltage across 10 ohm is 100 V. The current in the primary of the given transformer is :



(1) 10 A (2) $10/\sqrt{2}$ A (3) $10/\sqrt{3}$ A (4) 12.5 A

18. A single phase AC distributor supplies two single phase loads as shown in the given figure. The voltage drop from A to C is :



(1) 4.5 (2) 30 (3) 31.5 (4) 20

19. $\nabla.\left(\phi\bar{u}\right)=?$

(1) $\nabla\phi\times\bar{u}+\phi\left(\nabla\times\bar{u}\right)$ (2) $\nabla\phi.\bar{u}-\phi\left(\nabla.\bar{u}\right)$

(3) $\nabla\phi.\bar{u}+\phi\left(\nabla.\bar{u}\right)$ (4) $\nabla\phi\times\bar{u}-\phi\left(\nabla\times\bar{u}\right)$

SPACE FOR ROUGH WORK

P.T.O.

20. The discrete time system described by $y(n) = x(n^2)$ is :
(1) causal, linear and time variant
(2) causal, linear and time invariant
(3) non-causal, linear and time invariant
(4) non-causal, linear and time variant

---

21. In 220 kV system, the inductance and capacitance up to the location of circuit breaker is 0.0254 H and 0.025 microfarad respectively. The resistance of 600 ohm is connected across the contacts of the circuit breaker, the natural frequency of oscillation will be :
(1) 4.41 kHz (2) 6.31 kHz (3) 3.41 kHz (4) 10 kHz

---

22. A DC generator running at 1600 rpm gives 240 V dc. If the speed is dropped to 1400 rpm, without change in flux, the new e.m.f. will be :
(1) 270 V (2) 240 V (3) 237 V (4) 210 V

---

23. The z-Transform of sequence $\{f(k)\}$ is defined as :
(1) $\sum_{k=-\infty}^{\infty} f(k)z$ (2) $\sum_{k=-\infty}^{\infty} \frac{f(k)}{z^k}$ (3) $\sum_{k=-\infty}^{\infty} f(k)z^k$ (4) None of these

---

24. The trigonometric Fourier series of a periodic time function have :
(1) sine term (2) cosine term
(3) DC terms and (1) and (2) (4) both (1) and (2)

---

25. A two port network is defined by the relations $I_1 = 2V_1 + V_2$ and $I_2 = 2V_1 + 3V_2$, then Z_{12} is :
(1) -1 ohm (2) -5 ohm (3) -0.5 ohm (4) None of these

---

26. A 3-phase fully controlled bridge converter with freewheeling diode is fed from 400 V, 50 Hz AC source and is operating at a firing angle of 60c. The load current is assumed constant at 10 A due to high load inductance. The Input Displacement Factor (IDF) and the Input Power Factor (IPF) of the converter will be :
(1) IDF = 0.867; IPF = 0.828 (2) IDF = 0.867; IPF = 0.552
(3) IDF = 0.5; IPF = 0.478 (4) IDF = 0.5; IPF = 0.318

---

27. If $f(z) = r^3 \cos 3\theta + ir^3 \sin k\theta$ is analytic, then k is equal to :
(1) 1 (2) 3 (3) -3 (4) 2

SPACE FOR ROUGH WORK

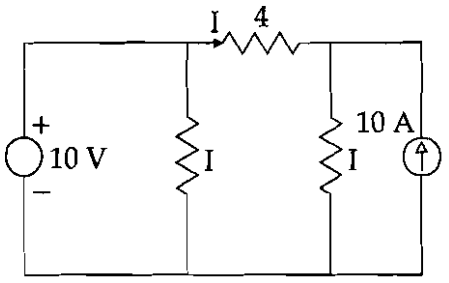
28. Two amplifiers, one having voltage gain of 40 and the other of 20 are coupled with negligible loading. The approximate gain of two-stage amplifier will be :

(1) 20 (2) 40 (3) 60 (4) 800

29. Maxwell's divergence equation for the magnetic field is given by :

(1) $\nabla.B = 0$ (2) $\nabla.B = \rho$ (3) $\nabla \times B = 0$ (4) $\nabla \times B = \rho$

30. In the network shown, what is the current I in the direction shown ?



(1) 0 A (2) 1/3 A (3) 5/6 A (4) 4 A

31. A D.C. Chopper has a TON (time to go on) of 1 msec and its frequency is 500 Hz. What will be its duty cycle ?

(1) 100% (2) 50%

(3) 25% (4) information is insufficient

32. An astable multivibrator requires _____.

(1) balanced time constants (2) a pair of matched transistors

(3) no input signal (4) dual J-K flip-flops

33. A 3-phase breaker is rated at 2000 MVA, 33 kV its making current will be :

(1) 35000 A (2) 49000 A (3) 70000 A (4) 89000 A

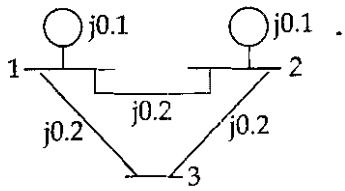
34. In any transmission line, AD − BC =

(1) −1 (2) +1 (3) A*B (4) C*D

SPACE FOR ROUGH WORK

P.T.O.

35. A sample power system network is shown in the given figure. The reactance are marked in p.u. The per unit value of Y_{22} of the bus admittance matrix (Y_{bus}) is :



(1) j10.0 (2) j0.4 (3) $-j0.1$ (4) $-j20.0$

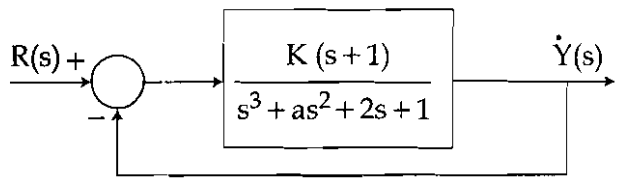
---

36. A half-controlled single-phase bridge rectifier is supplying an R-L load. It is operated at a firing angle α and the load current is continuous. The fraction of cycle that the free wheeling diode conducts is :

(1) $1/2$ (2) $1-\alpha/\pi$ (3) $\alpha/2\pi$ (4) α/π

---

37. The feedback system shown below oscillates at 2 rad/s when :



(1) $K=2$ and $a=0.75$ (2) $K=3$ and $a=0.75$

(3) $K=4$ and $a=0.5$ (4) $K=2$ and $a=0.5$

---

38. The open loop transfer function G(s) of a unity feedback control system is given as, $G(s)=[K^*(s+2/3)/s^2(s+2)]$. From the root locus, it can be inferred that when K tends to positive infinity :

(1) three roots with nearly equal real parts exist on the left half of the s-plane

(2) one real root is found on the right half of the s - plane

(3) the root loci cross the $j\omega$ axis for a finite value of K; $K \neq 0$

(4) three real roots are found on the right half of the s - plane

---

39. For an SCR, dv/dt protection is achieved through the use of :

(1) R in series with SCR (2) RL in series with SCR

(3) L in series with SCR (4) RLC in series with SCR

SPACE FOR ROUGH WORK

40. When the reverse voltage across a p-n junction is gradually decreased, the depletion regi
(1) does not change in width
(2) initially increases up to a certain width and then decreases
(3) continuously increases in width
(4) continuously decreases in width

---

41. The latching current of SCR is 18 mA. Its holding current will be :
(1) 16 mA (2) 18 mA (3) 54 mA (4) None of these

---

42. The Laplace transform of a function $f(t)$ is $F(s) = \frac{5s^2 + 23s + 6}{s\left(s^2 + 2s + 2\right)}$ as $t \to \infty$, $f(t)$ approaches :
(1) 3 (2) 5 (3) $\frac{17}{2}$ (4) ∞

---

43. A multiplexer is a logic circuit that :
(1) accepts one input and gives several outputs
(2) accepts many inputs and gives many outputs
(3) accepts many inputs and gives one output
(4) accepts one input and gives one output

---

44. A generating station has the maximum demand of 75 MW, a load factor of 60%, find the average demand.
(1) 45 MW (2) 41 MW (3) 0.41 MW (4) 125 MW

---

45. For the successful parallel operation of two single phase transformers, the most essential condition is that their :
(1) percentage impedances are equal
(2) turns ratio are exactly equal
(3) KVA ratings are equal
(4) polarities are properly connected

SPACE FOR ROUGH WORK

P.T.O.

46. In 3-phase controlled bridge rectifier, with an increase of overlap angle, the output DC voltage :

(1) decreases (2) does not change

(3) increases (4) depends upon load inductance

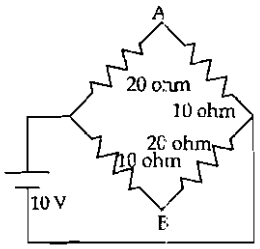
---

47. A power system network with a capacity of 100 MVA has a source impedance at 10% at a point. The fault MVA at that point is :

(1) 10 MVA (2) 30 MVA (3) 3000 MVA (4) 1000 MVA

---

48. In the bridge given in the figure, the voltage across A-B terminals is :



(1) zero (2) 6.66 V (3) 4.20 V (4) None of these

---

49. The second order homogeneous equation $y''+\frac{1}{x}Ay'+\frac{1}{x^2}By=0$ with A and B constant is called :

(1) Legendre Equation (2) Cauchy Equation

(3) Euler's Equation (4) Transcendental Equation

---

50. A 3 ph delta/star transformer is supplied at 6000 V on the delta connected side. The terminal voltage on secondary side when supplying full load at 0.8 lagging p.f. is 415. The equivalent resistance and reactance drop for the transformer are 1% and 5% respectively. The turn's ratio of the transformer is :

(1) 14 (2) 12 (3) 42 (4) None of these

---

51. For a three phase induction motor input power on no load is W_o = 600 watts and windage and friction losses W_f = 183 watts. The stator copper losses will be equal to :

(1) 783 (2) 600 (3) 183 (4) 517

SPACE FOR ROUGH WORK

52. If $f(z)$ is analytical on and within a closed contour 'c' expect a finite number of isolate singular points within 'c' then $\oint f(z)dz$ is :

(1) $2\pi \sum_{m=1}^{n} r_m$ (2) $\pi i \sum_{m=1}^{n} r_m$ (3) $\frac{2\pi i}{3} \sum_{m=1}^{n} r_m$ (4) None of these

53. Two 11 kV, 20 MVA, three phase star connected generator operated in parallel the positive, negative and zero sequence reactance of each j36, j30, j20 p.u. The star point of generator is isolated and that of the other is earthed to 2 ohm resistor. The single line to ground fault occurs at the terminals of one generator. The fault current will be :

(1) 2.5 p.u (2) 2.66 p.u (3) 1.24 p.u (4) 2.95 p.u

54. Which mode of operation is being used when a 555 timer chip has two external resistors and an external capacitor ?

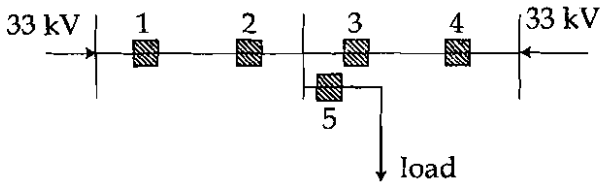
(1) monostable (2) pulse stretching

(3) Schmitt triggering (4) astable

55. An n-channel JFET has pinch-off voltage $V_P = -4$ volts. Given $V_{GS} = -1$ V, the minimum V_{DS} for the device to operate in the pinch-off region will be :

(1) +1 V (2) +3 V (3) +4 V (4) +5 V

56. The distribution system shown in figure below is to be protected by over current system of protection. For proper fault discrimination directional over current relays will be required at locations :



(1) 1 and 4 (2) 2 and 3 (3) 1, 2 and 5 (4) 2, 3 and 5

57. In a thyristor D.C. chopper, which type of commutation results in best performance ?

(1) Voltage commutation (2) Current commutation

(3) Load commutation (4) Supply commutation

SPACE FOR ROUGH WORK

P.T.O.

58. Steady state stability of a power system is the ability of power system to :

(1) maintain voltage at rated voltage level

(2) maintain frequency exactly at 50 Hz

(3) maintain a spinning reserve margin at all times

(4) maintain synchronism

---

59. The per unit impedance of a synchronous machine is 0.242. If base voltage is increased by 1.1 times, the per unit value will be :

(1) 0.269 (2) 0.242 (3) 0.250 (4) 0.200

---

60. System described by $y(n) = x(n) + x(n-2)$ is :

(1) Causal (2) Non-causal (3) Arbitrary (4) Both (1) and (3)

---

61. Coefficient of correlation between the variables x and y is 0.8 and their covariance is 20, the variance of x is 16. Standard Deviation of y is :

(1) 6.75 (2) 8.25 (3) 7.5 (4) 6.25

---

62. The leakage resistance of a 50 km long cable is 1 MΩ, for 100 km long cable it will be :

(1) 1 MΩ (2) 2 MΩ (3) 0.88 MΩ (4) None of these

---

63. Digital voltmeter measures :

(1) peak value (2) rms value

(3) peak to peak value (4) average value

---

64. A DC motor develops a torque of 140 N-m at 1400 rpm. If the motor now runs at 1000 rpm, the torque developed will be :

(1) 1400 N-m (2) 1000 N-m (3) 140 N-m (4) 410 N-m

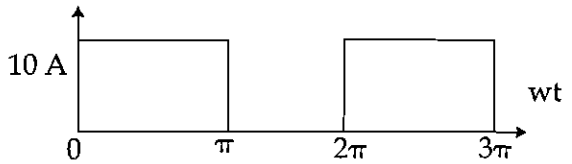
---

65. A three phase induction motor has a copper loss of 800 watts and slip of 4%. The rotor input must be :

(1) 8 kW (2) 4 kW (3) 0.2 kW (4) 2 kW

SPACE FOR ROUGH WORK

66. A MOSFET rated for 15 A, carries a periodic current as shown in figure. The ON state resista of the MOSFET is 0.15 Ω. The average ON state loss in the MOSFET is :



(1) 33.8 W (2) 15.0 W (3) 7.5 W (4) 3.8 W

---

67. If $x[n]=\frac{1^n}{3}-\frac{1^n}{2}u[n]$, then the Region Of Convergence (ROC) of its z - transform in the z-plane will be :

(1) $1/3 < |z| < 3$ (2) $1/3 < |z| < 1/2$

(3) $1/2 < |z| < 3$ (4) $1/3 < |z|$

---

68. A 2 kVA transformer has iron loss of 150 watts and full load copper loss of 250 watts. The maximum efficiency of the transformer would occur when the total loss is :

(1) 500 watts (2) 300 watts (3) 400 watts (4) 275 watts

---

69. The given system of linear equation $x-4y+5z=-1$, $2x-y+3z=1$, $3x+2y+z=3$ has :

(1) Unique solution (2) No solution

(3) Infinitely many solutions (4) n − r solution

---

70. A single phase energy meter is operating on 230 V, 50 Hz, supply with a load of 20 amp. For two hours at UPF. The meter makes 1380 revolutions in that period. The meter onstant is :

(1) 0.15 rev/kWh (2) 105 rev/kWh (3) 150 rev/kWh (4) 1/150 rev/kWh

---

71. Four identical alternators each rated for 20 MVA, 11 kV, having a subtransient reactance of 16% are working in parallel. The short circuit level at the bus bar is :

(1) 500 MVA (2) 400 MVA (3) 125 MVA (4) 80 MVA

SPACE FOR ROUGH WORK

P.T.O.

72. The solution of $e^{dy/dx} = x$ is :

(1) $y = x + c$ (2) $y = e^x + c$

(3) $y = x\log x + c$ (4) $y = x\log\left(\frac{x}{e}\right) + c$

---

73. The corona loss on a particular system at 50 Hz is 1 kW/ph/km. The corona loss on the same system with the supply frequency 25 Hz will be :

(1) 1 kW/ph/km (2) 0.5 kW/ph/km

(3) 0.667 kW/ph/km (4) 1.667 kW/ph/km

---

74. The Fourier transform of a signal h(t) is $H(j\omega) = (2\cos\omega)(\sin 2\omega)/\omega$. The value of h(0) is :

(1) 1/4 (2) 1/2 (3) 1 (4) 2

---

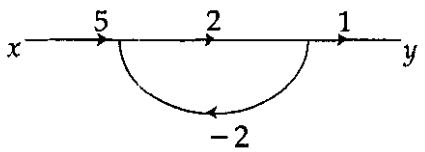
75. The input $x(t)$ of a system are related as $y(t) = \int_{-\infty}^{t} x(\tau)\cos(3\tau)d\tau$. The system is :

(1) time-invariant and stable (2) stable and not time-invariant

(3) time-invariant and not stable (4) not time-invariant and not stable

---

76. In signal flow graph of figure y/x equals :



(1) 3 (2) 5/2 (3) 2 (4) 3/2

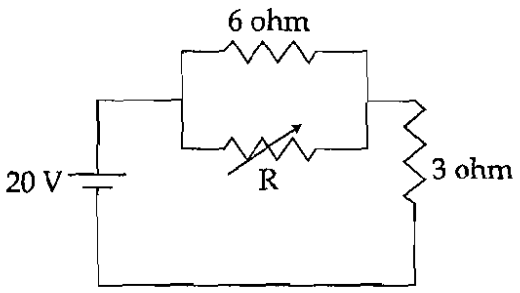
---

77. If $z = np$ where n is the number of trial is very large p probability of success at each trial, then Poisson's probability distribution $p(r)$ probability of r successes is given by :

(1) $\frac{e^z z}{r!}$ (2) $\frac{e^{-z}z^r}{r}$ (3) $\frac{e^{-z}z^r}{r!}$ (4) $\frac{e^z z^r}{r!}$

SPACE FOR ROUGH WORK

78. The value of resistance 'R' in the circuit shown is varied in such a manner that the powe dissipated in the 3 ohm resistor is maximum. Under this condition the value of 'R' will be :



(1) 9 ohm (2) 3 ohm (3) 12 ohm (4) 6 ohm

---

79. An average-reading digital multimeter reads 10 V when fed with a triangular wave, symmetric about the time-axis. For the same input an rms-reading meter will read :

(1) $20/\sqrt{3}$ (2) $10/\sqrt{3}$ (3) $20\sqrt{3}$ (4) $10\sqrt{3}$

---

80. Solution of equation $y' = x^2 + y^2$ for $x = 0.25$ and $x = 0.5$ given $y(0) = 1$:

(1) 1.37 and 1.97 (2) 1.33 and 1.81 (3) 1 and 2 (4) 1.21 and 1.37

- o 0 o -

SPACE FOR ROUGH WORK

सूचना — (पृष्ठ 1 वरून पुढे....)

(8) प्रश्नपुस्तिकेमध्ये विहित केलेल्या विशिष्ट जागीच कच्चे काम (रफ वर्क) करावे. प्रश्नपुस्तिकेव्यतिरिक्त उत्तरपत्रिकेवर वा इतर कागदावर कच्चे काम केल्यास ते कॉपी करण्याच्या उद्देशाने केले आहे, असे मानले जाईल व त्यानुसार उमेदवारावर शासनाने जारी केलेल्या "परीक्षांमध्ये होणाऱ्या गैरप्रकारांना प्रतिबंध करण्याबाबतचे अधिनियम-82" यातील तरतुदीनुसार कारवाई करण्यात येईल व दोषी व्यक्ती कमाल एक वर्षाच्या कारावासाच्या आणि/किंवा रुपये एक हजार रकमेच्या दंडाच्या शिक्षेस पात्र होईल.

(9) सदर प्रश्नपत्रिकेसाठी आयोगाने विहित केलेली वेळ संपल्यानंतर उमेदवाराला ही प्रश्नपुस्तिका स्वत:बरोबर परीक्षाकक्षाबाहेर घेऊन जाण्यास परवानगी आहे. **मात्र परीक्षा कक्षाबाहेर जाण्यापूर्वी उमेदवाराने आपल्या उत्तरपत्रिकेचा भाग-1 समवेक्षकाकडे न विसरता परत करणे आवश्यक आहे.**

नमुना प्रश्न

Pick out the correct word to fill in the blank :

Q. No. 201. I congratulate you _____ your grand success.

(1) for (2) at (3) on (4) about

ह्या प्रश्नाचे योग्य उत्तर "(3) on" असे आहे. त्यामुळे या प्रश्नाचे उत्तर "(3)" होईल. यास्तव खालीलप्रमाणे प्रश्न क्र. 201 समोरील उत्तर-क्रमांक "③" हे वर्तुळ पूर्णपणे छायांकित करून दाखविणे आवश्यक आहे.

प्र. क्र. 201. ① ② ● ④

अशा पद्धतीने प्रस्तुत प्रश्नपुस्तिकेतील प्रत्येक प्रश्नाचा तुमचा उत्तरक्रमांक हा तुम्हाला स्वतंत्ररीत्या पुरविलेल्या उत्तरपत्रिकेवरील त्या त्या प्रश्नक्रमांकासमोरील संबंधित वर्तुळ पूर्णपणे छायांकित करून दाखवावा. **ह्याकरिता फक्त काळ्या शाईचे बॉलपेन वापरावे, पेन्सिल वा शाईचे पेन वापरू नये.**

कच्च्या कामासाठी जागा /SPACE FOR ROUGH WORK