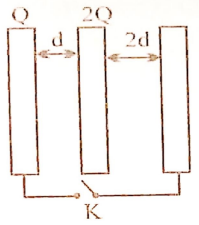
NEW STANDARD ACADEMY

Marks: 150

Date : 12-05-25 **CLASS : 12TH** **Time: $2\frac{1}{2}$ hours**

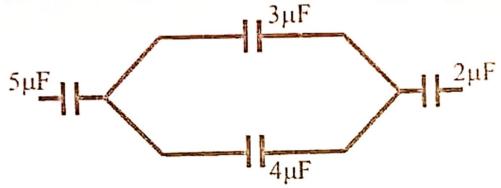
PHYSICS

1. Three large plates are arranged as shown How much charge will flow Through the key k if it is closed?



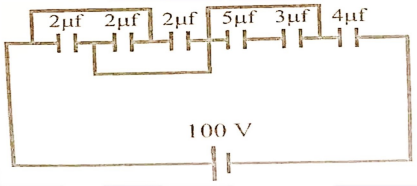
(a) $\frac{5Q}{6}$ (b) $\frac{4Q}{3}$
(c) $\frac{3Q}{2}$ (d) none

2. If charge on the left plate of the 5μF capacitor in the circuit segment shown in the figure is- 20μC, the charge on the right plate of 3μF capacitor is
(a) +



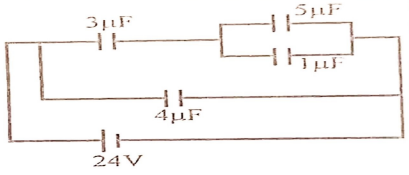
(a) +8.57μC (b) -8.57 μC
(c) +11.42 μC (d) -11.42 μC

3. In the circuit shown in figure charge stored in the capacitor of capacity 5 μF is



(a) 60 μC (b) 20 C
(c) 30 μC Zero

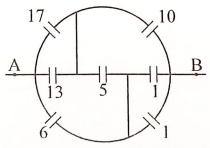
4. In the circuit shown, the energy stored in 1ul capacitor is



(a) 40 μJ (b)64 μJ
(c) 32 μJ (d) none

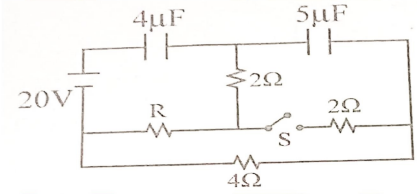
5. From a supply of identical capacitors rated 8 μF, 250 V, the minimum number of capacitors required to form a composite 16 μF, 1000 V is
(a) 2 (b) 4
(c) 16 (d) 32

6. Find equivalent capacitance across AB (all capacitances in μF)



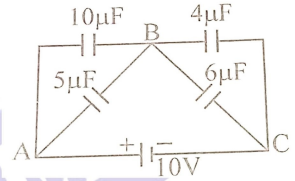
(a) $\frac{20}{3}\ \mu F$ (b) 9 μF
(c) 48 μF (d) None

7. Find heat produced in the capacitors on closing the switch S



(a) 0.0002 J (b) 0.0005 J
(c) 0.00075 (d) zero

Question No. 8 to 11 (4 questions)
In the circuit shown in figure, four capacitors are connected to a battery



8. The equivalent capacitance of the circuit is across AC is
(a) 25 μF (b) 6 μF
(c) 8.4 μF (d) zero

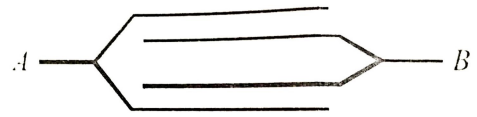
9. The charge on the 5 μF capacitor is
(a) 60 μC (b) 24 μC
(c) 12 μC (d) 20 μC

10. The potential difference across ther6 μF capacitor is
(a) 6V (b) 4V
(b) 5 V (d) None

11. The maximum energy is stored in the capacitor of
(a) 10 μF (b) 6 μF

(c) 5 μF (d) 4 μF

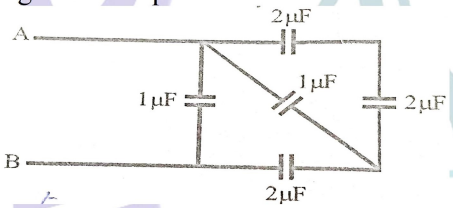
12. Four metallic plates each with a surface area of one side A, are placed at a distance d from each other . the two outer plates are connected to point A and the other two plates to another point B as shown in fig. Then the capacitance of the system across AB is:



(a) $\frac{\varepsilon_0 A}{d}$ (b) $\frac{2\varepsilon_0 A}{d}$
(c) $\frac{3\varepsilon_0 A}{d}$ (d) $\frac{4\varepsilon_0 A}{d}$

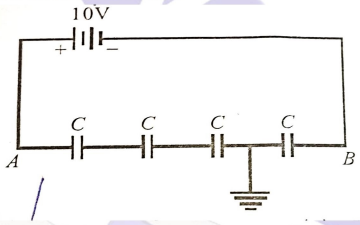
13. The energy stored by n – capacitors each of capacitance C connected in parallel to a source of V-volt is:
(a) CV (b) CV^2
(c) $\frac{1}{2n} CV^2$ (d) $\frac{1}{2} nCV^2$

14. The net capacitance of system of capacitors of fig. between points A and B is



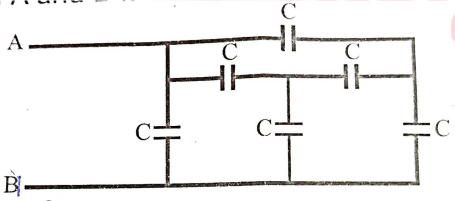
(a) 1 μF (b) 2 μF
(c) 3 μF (d) 4 μF

15. Four identical capacitors are connected in series with a 10V battery as shown in fig . The point N is earthed . The potential of point A and B are :N



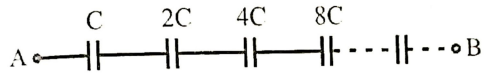
(a) 10V, 0V (b) 7.5v,-2.5V
(c) 5V,-5V (d) 7.5, 2.5V

16. Six equal capacitors each of capacitance C are connected as shown in fig . The equivalent capacitance between A and B is



(a) $\frac{C}{2}$ (b) 2C
(b) C (d) 6C

17. An infinite number of capacitors of capacitances C. 20 4C. 8C, 16C Are connected in series. The equivalent capacitance of the arrangement between A and B is

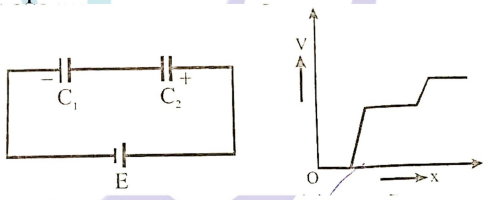


(a) C (b) $\frac{C}{2}$
(c) 2C (d) infinite

18. Two condensers C, and C, in a circuit are joined as shown in fig. The potential of point A is V, and that of point B is V The potential of point D will be
(a) $\frac{1}{2}(V_1 + V_2)$ (b) $\frac{C_1V_2+C_2V_1}{C_1+C_2}$
(c) $\frac{C_1V_1+C_2V_2}{C_1+C_2}$ (d) $\frac{C_2V_1+C_1V_2}{C_1+C_2}$

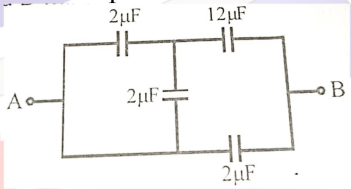
19. The distance between the plates of a parallel plate capacitor is 3mm and potential difference applied is 3×10^5 V. If an electron traveis from one plate to another the change in its potential energy is
(a) 3×10^5 Ev (b) 10^8 eV
(c) 900 eV (d) negligible

20. Fig shows two capacitors connected in series across a battery. The graph (b) shows the variation of potential as one moves from left to right on the branch containing the capacitors. Then:



(a) $C_1=C_2$ (b) $C_1< C_2$
(c) $C_1 > C_2$ (d) C_1 and C_2 can not be compared

21. Four capacitors are connected in a circuit as shown in fig The effective capacitance in μF between points A and B will be

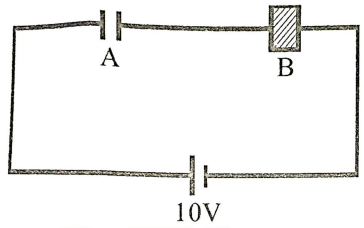


(a) $\frac{28}{9}$ (b) 4
(c) 5 (d) 18

22. Six identical charges +q each are placed at the corners of a regular hexagon. The charge that must be placed at the centre of the hexagon to make the whole system of charge at equilibrium is
(a) 5q (b) - 5q
(c) - 1.83q (d) q

23. Two insulated metallic spheres of capacitances 3μF and 5μF are charged to 300 V and 500 V respectively. The energy loss when they are connected by a wire is:
(a)0.025 J (b) 2.5 J
(c) 0.0375 J (d) 3.75 J

24. In the circuit below, capacitors A and B have identical geometry, but a material of dielectric constant 3 is present between the plates of B. The potential difference across A and B are respectively:



(a) 2V,8V (b) 2.5 V. 7.5 V
(c) 8V,2V (d) 7.5V,2.5V

25. A fully charged capacitor has a capacitance C It is discharged through a small coil of resistance wire embedded in a thermally insulated block of specific heat capacity s and mass m. If the temperature of the block is raised by AT, the potential difference across the capacitance
(a) $\frac{mC\Delta T}{S}$ (b) $\sqrt{\frac{2\,mC\Delta T}{S}}$
(c) $\sqrt{\frac{2\,ms\Delta T}{S}}$ (d) $\frac{2\,mC\Delta T}{C}$

CHEMISTRY

26. Unit of molar conductivity is :
(a) $ohm^{-1}cm^{-2}\ mol^{-1}$ (b) $ohm\ cm^{-2}\ mol^{-1}$
(c) $ohm^{-1}cm^{2}\ mol^{-1}$ (d) $ohm\ cm^{2}\ mol$

27. Reaction taking place at anode is :
(a) ionization (b) reduction
(c) oxidation (d) hydrolysis

28. Correct formula to calculate equilibrium constant:
(a) $\Delta G^0 = -\frac{2.303RT}{\log k_c}$
(b) $\Delta G^0 = -2.303RT\ \log k_c$
(c) $\Delta G^0 = -\frac{\log k_c}{2.303RT}$
(d) $\Delta G^0 = +2.303RT\ \log k_c$

29. Which of the following is not used in salt bridge ?
(a) CH_3COOK (b) NH_4NO_3
(c) KCI (d) KNO_3

30. Correct formula is:
(a) $\lambda_m = k \times V$ (b) $\lambda_{eq} = \frac{k\times1000}{c}$
(c) $\lambda_m = \frac{c}{k\times1000}$ (d) $\lambda_m = \frac{k\times100}{c}$

31. For cell, Ni/Ni^{2+} (1.0 M)|| Au^{3+} (1.0M) / Au, (if for Ni^{2+} / Ni , E^0 = - 0.25V and for Au^{3+} / Au , E^o = 1.50V) E_{cell} is:
(a) +4.0 V (b) -1.75 V
(c) +1.75 V (d) +1.25 V

32. Free energy change (ΔG) is related to the EMF of the cell (E) as:
(a) E = - nFΔG (b) ΔG= -nFE
(c) $\Delta G = \frac{-RT}{n}$ F logE (d) $\Delta G = -\frac{nF}{RT}\log(E)$

33. λ_m^o for which electrolyte may be determined with the help of a plot between $\sqrt{c}$ and molar conductivity ?
(a) NaCl and NaOH
(b) KCl and CH_3COOH
(c) NaOH & HCOOH
(d) NH_4OH and H_2SO_4

34. Molar conductance of CH_3COONa HCI and NaCl at infinite dilution in $ohm^{-1}\ cm^2\ mol^{-1}$ respectively are 91, 426.16 and 126.45. $\lambda_m^0$for CH_3 COOH is:
(a) 390.71 (b) 453
(c) 390 (d) 290

35. Standard reduction electrode potentials of three metals A, B and C are +0.5 V, -3.0 V, and -1.2 V respectively. The reducing power of these metals are:
(a) B > C > A (b) A > B > C
(c) C > B > A (d) A > C > B

36. $\lambda_H^o$and $\lambda^0_{CH_3COO^-}$ are respectively 349.8 and 40.9 $ohm^{-1}\ cm^2\ mo^{-1}$. At a given concentration, $\lambda^c_m$for CH_3COOH is 5.2. Degree of dissociation (α) for CH_3COOH at this concentration is:
(a) 0.026 (b) 0.013
(c) 0.13 (d) 0.02

37. $\lambda^0_{NH_4OH}$ may be calculated from the formula :
(a) $\lambda^0_m = \lambda^0_{NH_4^+} \times \lambda^0_{OH^-}$
(b)) $\lambda^0_m = \lambda^0_{NH_4Cl} + \lambda^0_{NaOH}$
(c) $\lambda^0_m = \lambda^0_{NH_4^+} + \lambda^0_{OH^-}$
(d) $\lambda^0_m = \lambda^0_{NH_4Cl} + \lambda^0_{NaOH} - \lambda^0_{NaCl}$

38. The amount of electricity required to produce one mole of Zn from $ZnSO_4$ solution will be
(a) 3 F (b) 2 F
(c) 1F (d) 4 F

39. Which will have highest conductance?
(a) Ag at 30 ^{0}C (b) Ag at 60 ^{0}C
(c) Cu at 30 ^{0}C (d) Cu at 60 ^{0}C

40. Consider the following standard electrode potential values:
Fe^{3+} (aq -)+e^- → Fe^{2+} (aq .) E^0 = 0.77V
MnO_4^- (aq.)+$8H^+$ + 5e → Mn^{+2} (aq.) + $4H_2O(l)$ E^0= 1.51 V
What is the cell potential for the redox reaction?

(a) -2.28 V (b) -0.74 V
(c) +0.74 V (d) + 2.28 V

Standard hydrogen electrode is represented by

$$\underset{(1\ atm)}{Pt\ |H_2(g)|}\ H^+\ \underset{(M)}{(aq+)}$$

The potential of SHE at 298 K has been arbitarly fixed at zero. When SHE is connected to another half-cell, reduction or oxidation may take place at SHE. It depends on the nature of another half cell. If in the another half cell, the molar cencentration of metal ion is one molar, then the potential of the complete cell is equal to E^0_{cell} of the other half cell at 298 K.

It is called standard electrode potential.

$E^0_{cell} = E^0_{cathode} - E^0$ anode

Molar conductance is determined by the following formula.

$$\lambda_m = \frac{k \times 1000}{Molarity}$$

Degree of dissociation (α) of a weak electrolyte is given by

$$\alpha = \frac{\lambda_m^c}{\lambda_m^0}$$

A battery or cell involves redox reaction. Batteries are of two types: (i) Primary battery (ii) Secondary battery.

41. Value of λ_m^0 for CH_3COONa and HCl is given. λ_m^0 of which electrolyte is more required to calculate λ_m^0 for CH_3COOH ?
(a) NaCl (b) HNO_3
(c) KNO_3 (d) KCl
42. Which reaction occurs in dry cell at anode ?
(a) $Zn^{2+} + 2e^- \rightarrow Zn$ (b) $Zn \rightarrow Zn^{2+} + 2e^-$
(c) $Pb^{2+} + 2e^- \rightarrow Pb$
(d) $H_2 + 2OH^- \rightarrow 2H_2O + 2e^-$
43. Calculate the EMF of the cell:
Zn / Zn^{2+} (1 M)$||Cu^{2+}$ (1 M)|Cu
Given that E^0 for Zn^{2+} | Zn and C u^{2+} Cu is -0.76 V and 0.34 V respectively.
(a) + 1.1 V (b) + 0.42 V
(c)-1.1 V (d) -0.42 V
44. Which metal oxide decomposes on heating?
(a) HgO (b) Ag_2O
(c) CaO (d) HgO and Ag_2O
45. $\lambda^0_{H^+}$ and $\lambda^0_{CH_3COO^-}$ are 179.8 and 40.9 Scm^2/mol respectively. Calculate the degree of dissociation of 0.1 CH_3COOH, given that λ_m for CH_3COOH at this concentration 5.2S cm^2 / mol
(a) 0.013 (b) 1.5
(c) 0.024 (d) 0.36

Directions: In the following questions a statement of assertion (A) followed by a statement of reason (R) is given. Choose the correct answer out of the following choices.

(a) Assertion (A) (A) and reason (R) both are correct statements and reason (R) is correct explanation texplanation for assertion (A)
(b) Assertion (A) and reason (R) both are correct statements but reason (R) is not correct expianation for assertion (A).
(c) Assertion (A) is correct statement but reason (R) is wrong statement.
(d) Assertion (A) is wrong statement but reason (R) is correct statement.

46. **Assertion (A):** $\wedge_m$ for weak electrolytes shows a sharp increase when the electrolytic solution is diluted.
Reason (R): For weak electrolytes degree of dissociation increases with dilution of solution.
47. **Assertion (A):** Conductivity of an electrolyte increases with decrease in concentration.
Reason (R): Number of ions per unit volume decreases on dilution.
48. **Assertion (A):** λ_m for weak electrolytes shows a sharp decrease when the electrolytic solution is diluted.
Reason (R): For weak electrolytes, degree of dissociations increases with dilution of solution.
49. **Assertion (A):** $E^0_{Cu^{2+}/Cu}$ is positive (+0.34 V).
Reason (R): Copper has high $\Delta_a H^0$ and low $\Delta_{hya} H^0$.
50. **Assertion (A):** If a solution contains H^+ and Na^+ ions, the H^+ ions are reduced at cathode.
Reason (R): Cations with higher E^0 value are reduced first at the cathode.

BIOLOGY

51. A stable population is one which has got :
(a) No growth of population in the last decade.
(b) Constant rate of growth of population in the last decade.
(c) Slow growth of population in the last decade.
(d) Growth of 20% in excess than the last decade.
52. Among the following methods of contraception, which can be regarded as the most cost effective reversible contraceptive ?
(a) Copper 'T' (b) Oral pills
(c) Tubectomy (d) Vasectomy
53. Oral contraceptive pills should not be prescribed to the women at what age ?
(a) << 20 years (b) >> 40 years
(c) >> 30 years (d) None of these

54. In the production of test tube babies:
(a) Fertilization is internal and foetus formation external
(b) Fertilization is external and foetus formation internal
(c) Fertilization and foetus formation is external
(d) Fertilization and foetus formation is internal

55. Artificial insemination means:
(a) Transfer of sperms of husband to a test tube containing ova.
(b) Artificial introduction of sperms of a healthy donor into the vagina.
(c) Introduction of sperms of a healthy donor directly into the ovary.
(d) Transfer of sperms of a healthy donor to a test tube containing ova.

56. The method to half infertile couples to produce children is called:
(a) MTP (b) IUD
(c) ART (d) Tubectomy

57. Nil sperms in semen are called:
(a) Oligospermia (b) Polyspermia
(c) Azoospermia (d) None of these

58. Which of the following IUDs is the hormone releasing device?
(a) Multiload 375 (b) CuT
(c) LNG-20 (d) Lippes loop

59. Progestasert is a :
(a) hormonal IUD
(b) Brand name of a condom
(c) Brand name of oral pills
(d) A surgical procedure

60. Lactational amenorrhea is the:
(a) Excessive menstrual flow during lactation periods
(b) Milky discharge from vagina
(c) Absence of lactation during periods
(d) Absence of periods during lactation (breast feeding) period

61. Emergency contraceptives must be used within :
(a) 24 hours of coitus (b) 48 hours of coitus
(c) 72 hours of coitus (d) 5 days of coitus

62. Vasectomy involves the :
(a) Cutting and tying of fallopian tubes
(b) Cutting and tying of vas deferens
(c) Removal of testes
(d) Removal of uterus

63. Cu ions in many IUDs help in :
(a) Killing sperms
(b) Reducing sperm motility
(c) Killing the ovum
(d) Making the ovum resistant to sperms

64. Saheli is:
(a) Once a week pill (b) Once a month pill
(c) 21 days pill (d) Every day pill

65. MTP is considered safe upto :
(a) 12 weeks of pregnancy
(b) 20 weeks of pregnancy
(c) 24 weeks of pregnancy
(d) 30 weeks of pregnancy

66. Which one of the following events is correctly matched with the time period in a normal menstrual cycle?
(a) Release of egg: 5th day
(b) Endometrium regenerates: 5-10 days
(c) Endometrium secretes implantation: 11-18 days nutrients for
(d) Rise in progesterone level: 1.15 days

67. Which of the following represents a condition where the motility of the sperms is highly reduced ?
(a) Oligospermia (b) Athenospermia
(c) Azoospermia (d) Polyspermy

68. In the human female, menstruation can be deferred by the administration of:
(a) Combination of FSH and LH
(b) Combination of estrogen and progesterone
(c) FSH only (d) LH only

69. Which of the following is correct about human Reproduction:
(a) 'Saheli' is a new contraceptive for males
(b) Amniocentesis is carried out to know the chromosomal pattern from the sample taken from the cells of umbilical cord
(c) Ovulation is facilitated by breast-feeding
(d) A combination of progesterone and oestrogen is injected or implanted under the skin as an effective contraceptive

70. A vasectomy prevents:
(a) Production of semen
(b) A man from having an erection
(c) Production of sperm in the testes
(d) Movement of sperm into the urethra

71. Which of the following contraceptive makes uterus unsuitable for implantation ?
(a) CUT (b) Cu7
(c) Multiload 375 (d) Progestesert

72. Tubectomy is a method of sterilization in which :
(a) Small part of the fallopian tube is removed or tied up
(b) Ovaries are removed surgically
(c) Small part of vas deferens is removed or tied up
(d) Uterus is removed surgically

73. Which of the following is a hormone releasing Intra Uterine Device (IUD):
(a) Multiload 375 (b) LNG-20
(c) Cervical cap (d) Vault

74. Assisted reproductive technology, IVF involves transfer of :

(a) Ovum into the fallopian tube
(b) Zygote into the fallopian tube
(c) Zygote into the uterus
(d) Embryo with 16 blastomeres into the fallopian tube

75. What is the work of copper-T ?
(a) To inhibit ovulation
(b) To inhibit fertilisation
(c) To inhibit implantation
(d) To inhibit gametogenesis

MATH

51. If A= $\begin{bmatrix}2 & -1 & 3\\ 4 & 5 & -6\end{bmatrix}$ and B $\begin{bmatrix}1 & 2\\ 3 & 4\\ 5 & -6\end{bmatrix}$ then
(a) only Ab is defined
(b) Only BA is defined
(c)AB and BA are both defined
(d) Ab and BA both are not defined

52. If A = $[a_{ij}]_{2\times 2}$ Where $a_{ij} = \begin{cases}1, if\ i \neq j\\ 0, if\ i = j\end{cases}$ then $A^2$is equal to
(a) I (b) A
(c) O (d) none of these

53. The number vof all possible matrices of order $3\times 3\ with\ each\ entey\ 0\ or\ 1\ is$
(a) 18 (b) 27
(c) 81 (d) 512

54. If A=$\frac{1}{\pi}\begin{bmatrix}sin^{-1}(\pi x) & tan^{-1}\left(\frac{x}{\pi}\right)\\ sin^{-1}\left(\frac{x}{\pi}\right) & cot^{-1}(\pi x)\end{bmatrix}$ and
B = $\frac{1}{\pi}\begin{bmatrix}-cos^{-1}(\pi x) & tan^{-1}\left(\frac{x}{\pi}\right)\\ sin^{-1}\left(\frac{x}{\pi}\right) & -tan^{-1}(\pi x)\end{bmatrix}$ then
A-B is equal to
(a) I (b) $\frac{1}{2}\ I$
(c) O (d) 2I

55. If A = $\begin{bmatrix}1 & 1\\ 1 & 1\end{bmatrix}$ satisfies A^5 = kA , then the value of k is
(a) 5 (b) 8
(c) 16 (d) 32

56. If A and B are symmetric matrices of same order then AB'-BA' is a
(a) skew- symmetric matrix
(b) Symmetric matrix
(c) null matrix (d) unit matrix

57. If A and B are square matrices of same order such that AB = A and BA= B , then A^2+B^2=
(a) AB (b) A+B
(c) 2AB (d) 2BA

58. The matrix $\begin{bmatrix}0 & -5 & 3\\ 5 & 0 & -7\\ -3 & 7 & 0\end{bmatrix}$is a
(a) diagonal matrix (b) symmetric matrix
(c) skew- symmetric matrix
(d) scalar matrix

59. If for the matrix A = $\begin{bmatrix}tanx & 1\\ -1 & \tan x\end{bmatrix}$, A +A'= $2\sqrt{3}$ I , then the value of $x \in \left[0, \frac{\pi}{2}\right]$ is
(a) 0 (b) $\frac{\pi}{4}$
(c) $\frac{\pi}{3}$ (d) $\frac{\pi}{6}$

60. If A = $\begin{bmatrix}2 & 1\\ -4 & -2\end{bmatrix}$, then the value of I- A +A^2- A^3+… is
(a) $\begin{bmatrix}-1 & -1\\ 4 & 3\end{bmatrix}$ (b) $\begin{bmatrix}3 & 1\\ -4 & -1\end{bmatrix}$
(c) $\begin{bmatrix}0 & 0\\ 0 & 0\end{bmatrix}$ (d) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$

61. If the matrix A = $\begin{bmatrix}0 & x+y & 1\\ 3 & z & 2\\ x-y & -2 & 0\end{bmatrix}$ is a skew – symmetric matrix then
(a) x = 2 , y =1, z = 0
(b) x = 2, y = 2, z = 0
(c) x = -2,y = -1, z = 0
(d) x = -2, y = -1, z = -1

62. For I = $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$, if X and Y are square matrices of order 2 such that XY = X and YX = Y then (Y^2+2Y) is equal to
(a) 2Y (b) I+3x
(c) I+3Y (d) 3Y

63. If M = $\begin{bmatrix}1 & 2\\ 2 & 3\end{bmatrix}$ and $M^2 - \lambda M - I_2 = 0$, then $\lambda =$
(a) -2 (b) 2
(c) -4 (d) 4

64. If A = $\begin{bmatrix}i & 0\\ 0 & i\end{bmatrix}$, n $\in N\ then\ A^{4n}$equal
(a) $\begin{bmatrix}1 & 0\\ 0 & 1\end{bmatrix}$ (b) $\begin{bmatrix}i & 0\\ 0 & i\end{bmatrix}$
(c) $\begin{bmatrix}0 & i\\ i & 0\end{bmatrix}$ (d) $\begin{bmatrix}0 & 0\\ 0 & 0\end{bmatrix}$

65. If ω is a complex cube root of unity , then the matrix A = $\begin{bmatrix}1 & \omega^2 & \omega\\ \omega^2 & \omega & 1\\ \omega & 1 & \omega^2\end{bmatrix}$ is
(a) singular matrix
(b) non – singular matrix
(c) skew –symmetric matrix
(d) none of these

66. If A is a square matrix of order 3 , then |adj.(adj.A^2)|
(a) $|A|^2$ (b) $|A|^4$
(c) $|A|^8$ (d) $|A|^{16}$

67. If A and B are invertible matrices then which of the following is not correct?
(a) adjA = |A| A^{-1}
(b) det (A^{-1}) = [det(A)]$^{-1}$
(c) $(AB)^{-1}$=$B^{-1}A^{-1}$
(d) $(A+B)^{-1} = B^{-1} + A^{-1}$

68. Let A+2B = $\begin{bmatrix}1 & 2 & 0\\ 6 & -3 & 3\\ -5 & 3 & 1\end{bmatrix}$ abd 2A-B =

$\begin{bmatrix} 2 & -1 & 5 \\ 2 & -1 & 6 \\ 0 & 1 & 2 \end{bmatrix}$.Then Tr(A) – Tr(B) has the value equal to

(a) 0 (b) 1
(c) 2 (d) None of these

69. The minimum number of zeroes in a upper triangular matrix of order n is

(a) $\frac{n(n-1)}{2}$ (b) $\frac{n(n+1)}{2}$
(c) $\frac{2n(n-1)}{2}$ (d) none of these

70. If A is a square matrix of order 3 with |A| = 2 then the value of $|(A-A^T)^5| + |(A^T-A)^3|$is

(a) 0 (b) 8
(c) 16 (d) 32

71. If $\begin{bmatrix} 1 & 2 & a \\ 0 & 1 & 4 \\ 0 & 0 & 1 \end{bmatrix}^n = \begin{bmatrix} 1 & 18 & 2007 \\ 0 & 1 & 36 \\ 0 & 0 & 1 \end{bmatrix}$ then the value of (n+a) is

(a) 100 (b) 150
(c) 200 (d) 250

72. If $\begin{bmatrix} \alpha & \beta \\ \gamma & -\alpha \end{bmatrix}$ is to be the square root of two-rowed unit matrix , then α, β and γshould satisfy the relation

(a) 1-$\alpha^2 + \beta\gamma = 0$ (b) $\alpha^2 + \beta\gamma - 1 = 0$
(c) 1+$\alpha^2 + \beta\gamma = 0$ (d) 1-$\alpha^2 - \beta\gamma = 0$

73. Let matrix A=$\begin{bmatrix} x & y & -z \\ 1 & 2 & 3 \\ 1 & 1 & 2 \end{bmatrix}$ where x,y,z ∈ N.If |adj. (adj. (adj.A)))| = $4^8 \times 5^{16}$, then the number of such matrices A is

(a) 28 (b) 36
(c) 45 (d) 55

74. The inverse of skew – symmetric matrix of odd order

(a) is a symmetric matrix
(b) is a skew – symmetric
(c) is diagonal matrix
(d) does not exits

75. Matrix $\begin{bmatrix} \lambda & -1 & 4 \\ -3 & 0 & 1 \\ -1 & 1 & 2 \end{bmatrix}$ is not invertible , if

(a) $\lambda = -15$ (b) $\lambda = -17$
(c) $\lambda = -16$ (d) $\lambda = -18$