

1. The intine of the pollen grain is a:
  1. Thick and discontinuous layer made of sporopollenin
  2. Thick and continuous layer made of sporopollenin
  3. Thin and discontinuous layer made of cellulose and pectin
  4. Thin and continuous layer made of cellulose and pectin
2. In the monosporic embryo sac of a flowering plant, the number of nuclei that get surrounded by cell walls and thus are organized into cells is:
  1. 5
  2. 6
  3. 7
  4. 8
3. Scientists are trying to transfer apomictic genes into hybrid varieties of several of our food and vegetable crops so that:
  1. They get resistance against common pathogens
  2. The yield of these plants can be increased many folds
  3. Hybrid seeds need not be produced every year
  4. Their germplasm is easily stored in labs for further research
4. Which human male accessory reproductive duct receives a duct from the seminal vesicle?
  1. Rete testis
  2. Vas deferens
  3. Epididymis
  4. Urethra
5. The primary oocyte completes its first meiotic division within the:
  1. Primary follicle
  2. Secondary follicle
  3. Tertiary follicle
  4. Graafian follicle
6. Which of the following is the most common abiotic pollinating agent?
  1. Insects
  2. Birds and bats
  3. Wind
  4. Water
7. Progesterone alone or in combination with estrogen can also be used as contraceptives by females as injections or implants under their skin. When used in this manner, they:
  1. do not affect the release of the ovum
  2. induce a foreign body reaction leading to rejection of the implanted blastocyst
  3. can cause increased risk of ectopic pregnancy
  4. have a much longer effective period
8. The asexual production of seeds is called as:
  1. Adventition
  2. Fragmentation
  3. Self-fertilization
  4. Apomixis
9. The layers in the walls of the microsporangium that helps in the dehiscence of anther to release the pollen include:
  - I. Epidermis
  - II. Endothecium
  - III. Middle layers
  - IV. Tapetum
  1. I and II only
  2. I, II and III only
  3. II and III only
  4. I, II, III and IV
10. Both chasmogamous and cleistogamous

flowers, are produced by

1. Pea and Zostera.
2. Bean and Vallisneria.
3. Maize and bamboo.
4. Oxalis and Commelina.

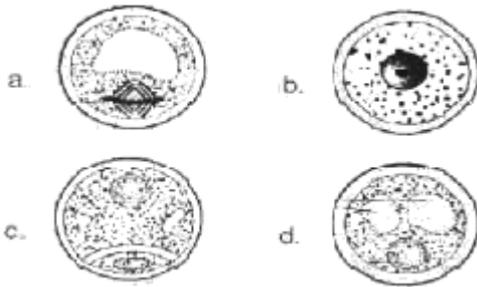
11.

In a stamen proximal end of filament is attached to

1. Anther.
2. Thalamus or petals.
3. Sepals.
4. Gynoecium.

12.

Arrange the following stages of microspore development into pollen grain, in correct sequence



1. b, c, d, and a
2. b, d, a and c
3. a, c, b and d
4. b, a, d and c

13.

If mammalian ovum fails to get fertilized, which one of the following is unlikely -

1. Estrogen secretion further decreases
2. Progesterone secretion rapidly declines
3. Corpus luteum will disintegrate
4. Primary follicle starts developing

14.

The pollen grain represents

1. Male gamete
2. Male gametophyte

3. Microsporophyll

4. Microsporangium

15.

In case of a couple where the male is having a very low sperm count, which technique will be suitable for fertilisation?

1. Intrauterine transfer
2. Gamete intracytoplasmic fallopian transfer
3. Artificial Insemination
4. Intracytoplasmic sperm injection

16.

What is the function of copper ions in copper releasing IUDs?

1. They increase phagocytosis of sperm within the uterus
2. They suppress sperm motility and the fertilising capacity of sperms
3. They make the uterus unsuitable for implantation
4. They inhibit ovulation

17.

The extra embryonic membranes of the mammalian embryo are derived from

1. Trophoblast
2. Inner cell mass
3. Formative cells
4. Follicle cells

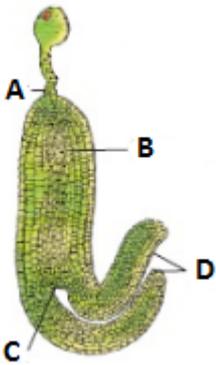
18.

In the 28 day human ovarian cycle, the duration of luteal phase is approximate?

1. 14 days
2. 28 days
3. 30 days
4. 5 days

19.

What functions as the embryonic root of the plant?



1. A
2. B
3. C
4. D

20.

Select the correct sequence for transport of sperm cells in male reproductive system.

1. Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus
2. Seminiferous tubules → Vasa efferentia → Epididymis → Inguinal canal → Urethra
3. Testis → Epididymis → Vasa efferentia → Vas deferens → Ejaculatory duct → Inguinal canal → Urethra → Urethral meatus
4. Testis → Epididymis → Vasa efferentia → Rete testis → Inguinal canal → Urethra

21.

At the end of spermatogenesis, sperms heads become embedded in the sertoli and finally released from the seminiferous tubules by the process called

1. Spermiogenesis
2. Spermateliosis
3. Spermiation
4. Androgenesis

22.

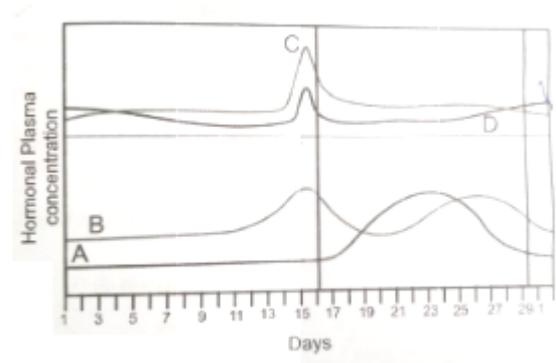
Which of the following statements is false about filiform apparatus?

1. The synergids have special cellular thickenings at the micropylar tip called filiform apparatus
2. It plays an important role in guiding the pollen tubes into the synergid
3. Both 1 and 2

4. Pollen tube stimulates the formation of filiform apparatus

23.

Graphical representation of ovarian and pituitary hormones are given below. Identify the hormones A, B, C and D



1. A - estrogen, B - progesterone, C - LH, D - Fish
2. A - FSH, B - LH, C - estrogen, D - Progesterone
3. A - progesterone, B - estrogen, C - LH, D - FSH
4. A - Progesterone, B - estrogen, C - FSH, D - LH

24.

The first movement of foetus and appearance of hair on the head are usually observed during

1. 3<sup>rd</sup> month
2. 5<sup>th</sup> month
3. 3<sup>rd</sup> and 5<sup>th</sup> month respectively
4. 4<sup>th</sup> and 6<sup>th</sup> month respectively

25.

Mark the incorrect match that is not related?

1. Sertoli cell - Spermiation
2. Spermatid - Spermiogenesis
3. Secondary spermatocyte - Mitotic division
4. Spermatozoa - Capacitation

26.

Odd one out in given barrier method of contraception

1. Nirodh
2. Diaphragm
3. Vaults

4. Cervical cap
27. In mature pollen grain, vegetative cell differs from generative cell as the former
1. Floats in the cytoplasm of generative cell.
  2. Is smaller in size.
  3. Is spindle shaped with dense cytoplasm.
  4. Have abundant food reserve and large nucleus
28. In monoecious plants like castor and maize
1. Autogamy and allogamy are not prevented
  2. Geitonogamy is prevented
  3. Autogamy is not prevented
  4. Geitonogamy is not prevented
29. During coitus the human male ejaculates about
1. 200 to 400 million sperms
  2. 100 to 200 million sperms
  3. 200 to 300 sperms
  4. 200 to 300 billion sperms
30. The hilum is a scar on the
1. Seed, where micropyle was present
  2. Seed, where funicle was attached
  3. Fruit, where it was attached to pedicel
  4. Fruit, where style was present
31. Which of the following is false about xenogamy?
1. It is the transfer of pollen grains from anther to stigma of another plant of the same species.
  2. It produces genetic variation
  3. It is genetically and ecologically (= functionally) cross pollination.
  4. It occurs in cleistogamous flowers
32. Level of estrogen and progesterone are minimum at the time of
1. Follicular phase.
  2. Ovulation.
  3. Secretory phase.
4. Onset of menstrual phase.
33. Diaphragms, cervical caps and vaults prevent conception by
1. Increasing phagocytosis of sperms within uterus.
  2. Suppressing sperm motility.
  3. Inhibiting ovulation and implantation.
  4. Blocking the entry of sperms through the cervix.
34. The cell in the pollen grain which is responsible for giving rise to male gamete is
1. Rod shaped with dense cytoplasm
  2. Of smaller size and float in the cytoplasm
  3. Capable of dividing meiotically and give rise two male gamete
  4. It has abundant food reserve and large irregularly shaped nucleus.
35. Which of the following is very close to the time of ovulation?
1. Peak of progesterone.
  2. Minimum level of estrogen.
  3. Peak of LH and FSH.
  4. Thickest layer of endometrium.
36. Apomixis is a mechanism in which
1. Nucellus or integuments never participate in embryo formation.
  2. Seeds are produced without fertilization.
  3. A diploid egg is fertilized by a male gamete.
  4. Embryo always develops from haploid cells.
37. Select the incorrect statement w.r.t. parturition.
1. Fully developed foetus and placenta induce mild uterine contractions.
  2. It is a complex neuroendocrine mechanism.
  3. Foetal ejection reflex triggers release of oxytocin from foetal pituitary gland.
  4. The signal for parturition is called foetal ejection reflex
38. Select the mismatch w.r.t. function of contraceptives.
- 1.

Oral contraceptive pills	-	Prevent ovulation	3. IUDs increase phagocytosis of sperms in the uterus. 4. IUDs suppress gametogenesis.
2.	Barrier methods	-	43. Prevent physical meeting of gametes. What type of pollination takes place in Vallisneria ? 1. Pollination occurs in submerged condition by water. 2. Flowers emerge above surface of Water and pollination occurs by insects. 3. Flowers emerge above water surface and pollen is carried by wind. 4. Male flowers are carried by water currents to female flowers at surface of water.
3.	Lactational amenorrhoea	-	Prevents lactation
4.	Vasectomy	-	Prevents gamete transport.
39.	Which of the following cell completes the first meiotic division leading to the formation of two equal, haploid cells?		44. Which of the following depicts the correct pathway of transport of sperms? 1. Rete testis → Efferent ductules → Epididymis → vas deferens 2. Rete testis → Epididymis → Efferent ductules → vas deference 3. Rete testis → Vas deference → Efferent ductules → Epididymis 4. Efferent ductules → Rete testis → Vas deference → Epididymis
	1. Spermatogonium 2. Primary spermatocytes 3. Secondary spermatocytes 4. Spermatids		
40.	Which of the following are ideal contraceptives for the female who wants to delay pregnancy and/or space children and one of the most widely accepted methods of contraception in India?		45. Several hormones like hCG, hPL, oestrogen, progesterone are produced by 1. ovary 2. placenta 3. Fallopian tube 4. pituitary
	1. Diaphragms 2. Intra uterine devices 3. Cervical caps 4. Oral contraceptives		
41.	No new follicles develop in the luteal phase of the menstrual cycle because :		46. Fertilisation in humans is practically feasible only if 1. the ovum and sperms are transported simultaneously to ampullary-isthmic junction of the fallopian tube 2. the ovum and sperms are transported simultaneously to ampullary-isthmic junction of the cervix 3. the sperms are transported into cervix within 48 hrs of release of ovum in uterus 4. the sperms are transported into vagina just after the release of ovum in fallopian tube
	1. Follicles do not remain in the ovary after 2. FSH levels are high in the luteal phase 3. LH levels are high in the luteal phase 4. Both FSH and LH levels are low in the luteal phase		
42.	Which of the following is a correct statement ?		47. Which one of the following is not the function of placenta? It 1. facilitates supply of oxygen and nutrients to embryo 2. secretes oestrogen 3. facilitates removal of carbon dioxide and
	1. IUDs once inserted need not be replaced. 2. IUDs are generally inserted by the user herself.		

- waste material from embryo  
4. secretes oxytocin during parturition
48.  
An oocyte is released from the ovary under the influence of LH  
1. After completing meiosis and before polar body are released  
2. After completing meiosis I and before release of polar body  
3. After completing meiosis  
4. After completing meiosis I and after release of polar body
49.  
The phase of menstrual cycle in humans that last for 7-8 days is:  
1. follicular phase  
2. ovulatory phase  
3. luteal phase  
4. menstruation
50.  
In humans, at the end of the first meiotic division, the male germ cells differentiate into the  
1. primary spermatocytes  
2. secondary spermatocytes  
3. spermatids  
4. spermatogonia
51.  
Which of the following is incorrect regarding vasectomy?  
1. No sperm occurs in seminal fluid  
2. No sperm occurs in epididymis  
3. Vasa deferentia is cut and tied  
4. Irreversible sterility
52.  
Consider the statements given below regarding contraception and answer as directed thereafter  
A. Medical Termination of Pregnancy (MTP) during first trimester is generally safe  
B. Generally, chances of conception are nil until mother breast-feeds the infants upto two year  
C. Intrauterine devices like copper-T are effective contraceptives  
D. Contraception pills may be taken up to one week after coitus to prevent conception  
Which two of the above statements are correct?  
1. B,C  
2. C, D  
3. A, C  
4. A, B
53.  
Endosperm is consumed by developing embryo in the seed of  
1. Coconut  
2. Pea  
3. Maize  
4. Castor
54.  
In which one of the following pollination is autogamous  
1. Geitonogamy  
2. Xenogamy  
3. Chasmogamy  
4. Cleistogamy
55.  
Advantage of cleistogamy is :  
1. More vigorous offspring  
2. No dependence of pollinators  
3. Vivipary  
4. Higher genetic variability
56.  
Transfer of pollen grains from the anther to the stigma of another flower of the same plant.  
1. Autogamy  
2. Cleistogamy  
3. Geitonogamy  
4. Xenogamy
57.  
Which of the following event does not occur after implantation?  
(a) Appearance of germinal layers  
(b) Formation of chorionic villi  
(c) Secretion of HCG  
(d) Formation of trophoblast and inner cell mass  
1. a, d  
2. c,d,  
3. d only  
4. c and d
58.  
Choose the correct statement regarding the ZIFT Procedure  
1. Ova is collected from the female donor and transferred to the Fallopian tube to facilitate zygote formation

2. Zygote is collected from a female donor and transferred to Fallopian tube

3. Zygote is collected from a female donor and transferred to the uterus

4. Ova is collected from a female donor and transferred to the uterus

59.

The pollen tube usually enters the embryo sac

1. Through one of the synergids
2. By directly penetrating the egg
3. Between one synergid and central cell
4. By knocking off antipodal cells.

60.

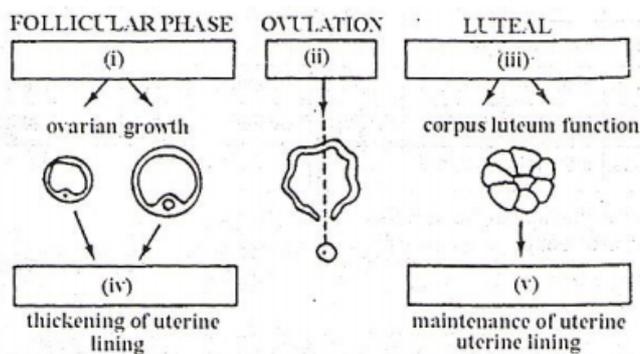
Which of the following is/are correct statement regarding contraception?

- (1) Insertion of IUD could be effective contraceptive within 3 days of unprotected sex
- (2) Morning after pills are used as emergency contraceptives
- (3) IUDs prevent STDs.
- (4) Lactational amenorrhea is due to hyperprolactinemia

1. (1) only
2. (1), (2) & (4) only
3. (1), (2) & (3) only
4. (1), (2), (3) & (4)

61.

The figure given below illustrates the changes taking place during the human menstruation cycle



In each of the boxes shown in the figure write the name of the hormone, or hormones controlling the

stage in the human menstrual cycle.

1. (i) FSH, (ii) LH, (iii) LH, (iv) Estrogen, (v) Progesterone
2. (i) LH, (ii) FSH, (iii) LH, (iv) Estrogen, (v) Progesterone
3. (i) FSH, (ii) LH, (iii) FSH, (iv) Estrogen, (v) Progesterone
4. (i) FSH, (ii) LH, (iii) LH, (iv) Progesterone, (v) Estrogen

62.

Which of the given below sexually transmitted disease in completely curable?

1. Trichomoniasis
2. Genital herpes
3. Hepatitis-B
4. HIV infection

63.

The part of the fallopian tube closest to the ovary is:-

1. Ampulla
2. Infundibulum
3. Cervix
4. Isthmus

64.

Read the following statements carefully and select the correct

- a. Tapetum cells possess dense cytoplasm and generally have more than one nucleus
- b. Sporopollenin is absent in the areas called germ pore
- c. Generative cell is small, spindle shaped with a irregularly shaped nuclei
- d. Spindle of first mitosis in pollen is asymmetric

1. a,b,c & d
2. a,b & c
3. a,c & d
4. a,b & d

65.

In ruptured ovum, correct sequence of layers from inside to outside is

1. Zona pellucida → Perivitelline space →

Corona radiata

2. Corona radiata → Zona pellucida → Perivitelline space

3. Perivitelline space → Zona pellucida → Corona radiata

4. Zona pellucida → Corona radiata → Perivitelline space

66.

The diameter of Pollen grain in the flowering plant is

1. 25–50 micrometers
2. 50–75 micrometers
3. 75–100 micrometers
4. 100–150 micrometers

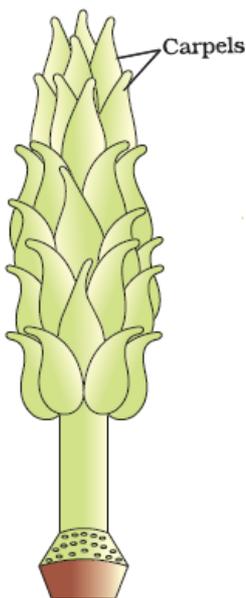
67.

At the time of implantation, cells attached to the endometrium of the uterus are

1. Inner cell mass
2. Trophoblast
3. Epiblast
4. Hypoblast

68.

Recognise the diagram and choose the correct option:-

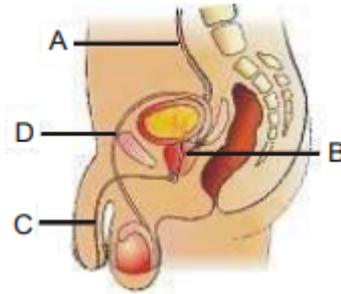


1. Hibiscus, multicarpellary syncarpous pistil
2. Multicarpellary syncarpous pistil of papaver
3. Multicarpellary apocarpous gynoecium of Michelia

4. Monocarpellary gynoecium

69.

It is a diagrammatic sectional view of male reproductive system, in which identify the ejaculatory duct:-



1. A
2. B
3. D
4. C

70.

Given below some Assisted Reproductive Technologies (ART). Which of the following techniques are related with invitro fertilization (IVF) :-

- a. ZIFT
  - b. ICSI
  - c. AI
  - d. IUT
  - e. GIFT
1. a, b, c, e
  2. a, c, e
  3. a, b, d
  4. a, b, c, d, e

71.

Some stages of development of dicot embryo are given below :-

- a. Proembryo
- b. Globular stage
- c. Heart shape
- d. Mature embryo

Arrange the given stages in correct sequence?

1. a, b, c, d

2. c, d, b, a

3. a, c, d, b

4. b, d, c, a

72.

medical Termination of Pregnancy (MTP) is considered safe up to how many weeks of pregnancy?

1. Eight weeks
2. Twelve weeks
3. Eighteen weeks
4. Six weeks

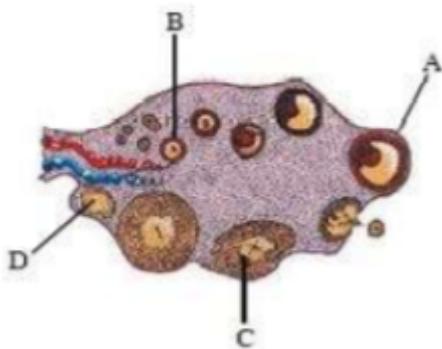
73.

Triple fusion involves the fusion of:-

1. Two male gametes and one egg cell
2. Two egg cell and one male gamete
3. Two male gametes and secondary nucleus
4. One male gamete and secondary nucleus

74.

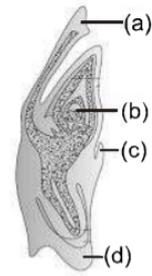
The figure below shows the development of follicles (A, B, C, D). Select the option giving correct identification together with its function?



1. B-Secondary Follicle - secretes progesterone
2. D-Corpus Albicans - Secretes estrogen
3. A-Tertiary follicle - Secretes FSH & LH
4. C-Corpus luteum - Secretes progesterone

75.

Given below a L.S. of an embryo of grass. Identify the labelled part (a), (b), (c) and (d) and select correct option about them :-



(a)	(b)	(c)	(d)
1) Coleoptile Shoot apex)	Colerhiza	Scutellum	
2) Scutellum Coleorhiza	Shoot apex	Epiblast	
3) Radicle Coleoptile	Root cap	Scutellum	
4) Root cap Coleorhiza	Scutellum	Radicle	

1. 1
2. 2
3. 3
4. 4

76.

How many seminiferous tubules are present in each testicular lobule?

1. 250
2. 750-1000
3. 1-3
4. 100

77.

A typical anther is

- (a) Tetrasporangiate
- (b) Tetragonal
- (c) Trilobed
- (d) Surrounded by four wall layers

The correct ones are

1. Only (a), (b) and (d)
2. Only (a) and (d)
3. Only (b) and (c)

4. All (a), (b), (c) and (d)
78.  
Choose the incorrect statement w.r.t. "Saheli".
1. It is a pre-coital contraceptive with a high contraceptive value
  2. It contains centchroman
  3. It is a "once a week" oral contraceptive pill
  4. It triggers estrogen receptors in the uterus, stimulating eggs for getting implanted
79.  
The site of synthesis of sperms is
1. Prostate
  2. Seminiferous tubules
  3. Seminal vesicle
  4. Bulbourethral gland
80.  
Pollen grains lose their viability within 30 minutes of their release in
1. Rice
  2. Legumes
  3. Rose
  4. Potato
81.  
Embryo sac of flowering plants
1. Is a 3 celled structure
  2. Is formed in microsporangium
  3. Has 7 cells and 8 nuclei
  4. Has pollen tetrads in them
82.  
Select the mismatch.
1. Liquor folliculi – Fluid filled in antrum
  2. Follicular atresia – Regression of follicles in ovary
  3. Granulosa cells – Secrete estrogen
  4. Zona pellucida – Glycolipid layer around primary oocyte secreted by granulosa cells only
83.  
Largest cell in embryo sac of angiosperm is
1. Synergid cell
  2. Egg
  3. Antipodal cell
  4. Central cell
84.  
The entry of pollen tube into the embryosac takes place due to the chemo-attractant secreted by
1. Tapetum
  2. Oosphere
  3. Filiform apparatus
  4. Antipodal
85.  
Oral contraceptives do not work by
1. Inhibition of ovulation
  2. Changing the consistency of cervical mucus
  3. Antagonistic action on gonadotropins
  4. Spermicidal action
86.  
Double fertilization includes
1. Endosperm and embryo development
  2. Ovules and ovary maturation
  3. Syngamy and triple fusion
  4. Porogamy and chalazogamy
87.  
If vas deferens in human male reproductive system is blocked, then transport of sperms will be blocked from
1. Rete testis to epididymis
  2. Vasa efferentia to epididymis
  3. Seminiferous tubules to rete testis
  4. Epididymis to ejaculatory duct
88.  
Which of the aquatic plants is not pollinated by water?
1. Vallisneria
  2. Zostera

3. Water hyacinth
4. Hydrilla
89. Which of the following is not associated with the secretion of milk in mammary glands?
1. Mammary duct
  2. Mammary lobes
  3. Mammary alveoli
  4. Glandular cells
90. Absence of acrosome will affect which activity in a normal sperm?
1. Maturation of sperm
  2. Energy utilization for movement
  3. Sperm motility
  4. Penetration into the ovum
91. The phenomenon in which polar crystals on heating produce electricity is called:-
1. pyro-electricity
  2. piezo-electricity
  3. ferro-electricity
  4. ferri-electricity
92. Lithium borohydride ( $\text{LiBH}_4$ ), crystallises in an orthorhombic system with 4 molecules per unit cell. The unit cell dimensions are:-  $a = 6.81 \text{ \AA}$ ,  $b = 4.43 \text{ \AA}$ ,  $c = 7.17 \text{ \AA}$ . If the molar mass of  $\text{LiBH}_4$  is  $21.76 \text{ g mol}^{-1}$ . The density of the crystal is:-
1.  $0.668 \text{ g cm}^{-3}$
  2.  $0.585 \text{ g cm}^2$
  3.  $1.23 \text{ g cm}^{-3}$
  4. None of these
93. The mass of a unit cell of CsCl corresponds to:-
1.  $8\text{Cs}^+$  and  $\text{Cl}^-$
  2.  $1\text{Cs}^+$  and  $6\text{Cl}^-$
  3.  $1\text{Cs}^+$  and  $1\text{Cl}^-$
  4.  $4\text{Cs}^+$  and  $\text{Cl}^-$
94. Which arrangement of electrons leads to anti-ferromagnetism?
1.  $\uparrow\uparrow\uparrow\uparrow$
  2.  $\uparrow\downarrow\uparrow\downarrow$
  3. Both (1) and (2)
  4. None of these
95. The density of KCl is  $1.9893 \text{ g cm}^{-3}$  and the length of a side unit cell is  $6.29082 \text{ \AA}$  as determined by X-rays diffraction. The value of Avogadro's number calculated from these data is:-
1.  $6.017 \times 10^{23}$
  2.  $6.023 \times 10^{23}$
  3.  $6.03 \times 10^{23}$
  4.  $6.017 \times 10^{19}$
96. pH of a 0.1 (M) mono basic is found to be 2. Hence osmotic pressure at given temperature T is-
1.  $0.1 \text{ RT}$
  2.  $0.11\text{RT}$
  3.  $1.1\text{RT}$
  4.  $0.01\text{RT}$
97. If an iron rod is dipped in  $\text{CuSO}_4$  solution, then:
1. blue colour of the solution turns red
  2. brown layer is deposited on iron rod
  3. no change occurs in the colour of the solution
  4. none of the above
98. Passage of three faraday of charge through aqueous solution of  $\text{AgNO}_3$ ,  $\text{CuSO}_4$ ,  $\text{Al}(\text{NO}_3)_3$  and  $\text{NaCl}$  will deposit moles of metals at the cathode in the molar ratio of:

1. 1 : 2 : 3 : 1  
 2. 6 : 3 : 2 : 6  
 3. 6 : 3 : 0 : 0  
 4. 3 : 2 : 1 : 0
99. In Arrhenius equation  $K = Ae^{-E_a/RT}$ , the quantity  $e^{-E/kT}$  is referred as:  
 1. Boltzmann factor  
 2. frequency factor  
 3. activation factor  
 4. none of these
100. For a given reaction, presence of catalyst reduces the energy of activation by 2 kcal at 27°C. The rate of reaction will be increased by:  
 1. 20 times  
 2. 14 times  
 3. 28 times  
 4. 2 times
101. Mole of  $K_2SO_4$  to be dissolved in 12 moles water to lower its vapour pressure by 10 mm of Hg at a temperature at which vapour pressure of pure water is 50 mm of Hg is  
 1. 3 mol  
 2. 0.5 mol  
 3. 1 mol  
 4. 2 mol
102. Which has highest freezing point ?  
 1. 0.01M NaCl  
 2. 0.05M Urea  
 3. 0.01 M  $MgCl_2$   
 4. 0.02 M NaCl
103. The appearance of colour in solid alkali metal halides is generally due to :-  
 1. Frankel Defect  
 2. Interstitial Defect  
 3. F-Centres  
 4. Schottky Defect
104. The relative lowering of vapour caused by dissolving 71.3g of a substance in 1000g of water is  $7.13 \times 10^{-3}$ . The molecular mass of substance is:-  
 1. 180  
 2. 18  
 3. 1.8  
 4. 360
105. Ice crystallises in a hexagonal lattice having volume of the unit cell as  $132 \times 10^{-24} \text{ cm}^3$ . If density is  $0.92 \text{ g/cm}^3$  at a given temperature, then number of  $H_2O$  molecules per unit cell is  
 1. 1  
 2. 2  
 3. 3  
 4. 4
106. How much oxygen is dissolved in 100ml water at 298K if partial pressure of oxygen is 0.5 atm and  $K_H = 1.4 \times 10^{-3} \text{ M/atm}$  ?  
 1. 22.4 mg  
 2. 22.4 g  
 3. 2.24 g  
 4. 2.24 mg
107. What will be the maximum work which can be obtained from a Daniel cell -  

$$Zn_{(s)} \mid Zn^{+2}_{(aq)} \parallel Cu^{+2}_{(aq)} \mid Cu_{(s)}$$

$$E^{\circ}_{Zn^{+2}/Zn} = -0.76 \text{ V and } E^{\circ}_{Cu^{+2}/Cu} = 0.34 \text{ V}$$
 1. 106.15 KJ  
 2. -212.3 KJ

3. 424.6 KJ  
4. +212.3 KJ
108.  
The quantity of electricity required to reduce 12.3g of nitrobenzene to aniline with 50% current efficiency is:-
- 1 F
  - 0.6 F
  - 0.5 F
  - 1.2 F
109.  
Rate constant for a chemical reaction takes place at 500 K, is expressed as  $K = A e^{-1000}$ . The activation energy of the reaction is
- 100 cal/mol
  - 1000 kcal/mol
  - $10^4$  kcal/mol
  - $10^6$  kcal/mol
110.  
A solution containing 6.8 g of a non ionic solute in 100 g of water was found to freeze at  $-0.93^\circ\text{C}$ . The freezing point depression constant of water is 1.86. Calculate the molecular weight of the solute
- 13.6
  - 34
  - 68
  - 136
111.  
During an electrolysis of conc.  $\text{H}_2\text{SO}_4$ , perdisulphuric acid ( $\text{H}_2\text{S}_2\text{O}_8$ ) and  $\text{O}_2$  form in equimolar amount. The amount of  $\text{H}_2$  that will form simultaneously will be ( $2\text{H}_2\text{SO}_4 \rightarrow \text{H}_2\text{S}_2\text{O}_8 + 2\text{H}^+ + 2\text{e}^-$ )
- thrice that of  $\text{O}_2$  in moles
  - twice that of  $\text{O}_2$  in moles
  - equal to that of  $\text{O}_2$  in moles
  - half of that of  $\text{O}_2$  in moles
112.  
In a reaction, the rate =  $k[\text{A}]^{-1}[\text{B}]^{2/3}$  the order of reaction is-
- 1/3
  - 2
  - 1/3
  - Zero
113.  
A catalyst lowers the activation energy of a reaction from  $20 \text{ kJ mole}^{-1}$  to  $10 \text{ kJ mole}^{-1}$ . The temperature at which the uncatalysed reaction will have the same rate as that of the catalysed at  $27^\circ\text{C}$  is
- $-123^\circ\text{C}$
  - $-327^\circ\text{C}$
  - $327^\circ\text{C}$
  - $+23^\circ\text{C}$
114.  
The rate of reaction triples when temperature change from  $20^\circ\text{C}$  to  $50^\circ\text{C}$ . Calculate energy of activation for the reaction.
- $28.81 \text{ kJ mol}^{-1}$
  - $38.51 \text{ kJ mol}^{-1}$
  - $18.81 \text{ kJ mol}^{-1}$
  - $8.31 \text{ kJ mol}^{-1}$
115.  
The rate constant of a particular reaction has the dimensions of a frequency. What is the order of the reaction?
- Zero
  - First
  - Second
  - Fractional
116.  
Which one of the following is incorrect for ideal solution?
- $\Delta H_{\text{mix}} = 0$
  - $\Delta U_{\text{mix}} = 0$
  - $\Delta P = P_{\text{obs.}} - P_{\text{calculated by Raoult's Law}} = 0$

4.  $\Delta G_{\text{mix}} = 0$

117.

Lithium has a bcc structure. Its density is  $530 \text{ kg m}^{-3}$  and its atomic mass is  $6.94 \text{ g mol}^{-1}$ . Calculate the edge length of a unit cell of lithium metal.

( $N_A = 6.02 \times 10^{23} \text{ mol}^{-1}$ )

1. 352 pm
2. 527 pm
3. 264 pm
4. 154 pm

118.

The correct statement regarding defects in the crystalline solid is

1. Schottky defects have no effect on the density of crystalline solids
2. Frenkel defects decreases the density of crystalline solids
3. Frenkel defect is a dislocation defect
4. Frenkel defect is found in halides of alkaline metals.

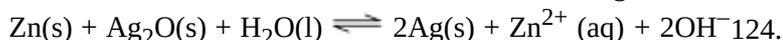
119.

Which one of the following electrolytes has the same value of van't Hoff factor (i) as that of  $\text{Al}_2(\text{SO}_4)_3$  (if all are 100% ionized)?

1.  $\text{K}_2\text{SO}_4$
2.  $\text{K}_3[\text{Fe}(\text{CN})_6]$
3.  $\text{Al}(\text{NO}_3)_3$
4.  $\text{K}_4[\text{Fe}(\text{CN})_6]$

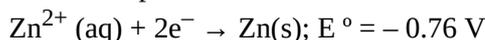
120.

A button cell used in watches functions as following



(aq)

If half cell potentials are :



V

The cell potential will be:

1. 0.42 V
2. 0.84 V
3. 1.34 V
4. 1.10 V

121.

Which one of the following statements for the order

of a reaction is incorrect?

1. Order is not influenced by stoichiometric coefficient of the reactants
2. Order of reaction is sum of power to the concentration terms of reactants to express the rate of reaction
3. Order of reaction is always the whole number
4. Order can be determined by experiments only

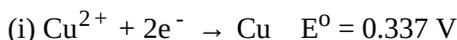
122.

A solution of sucrose (molar mass =  $342 \text{ g mol}^{-1}$ ) has been prepared by dissolving 68.5 g of sucrose in 1000 g of water. The freezing point of the solution obtained will be ( $k_f$  for water =  $1.86 \text{ K kg mol}^{-1}$ )

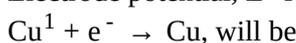
1.  $-0.372 \text{ }^\circ\text{C}$
2.  $-0.520 \text{ }^\circ\text{C}$
3.  $+0.372 \text{ }^\circ\text{C}$
4.  $-0.570 \text{ }^\circ\text{C}$

123.

Given,



Electrode potential,  $E^\circ$  for the reaction,



1. 0.52 V
2. 0.90 V
3. 0.30 V
4. 0.38 V

For the reaction,  $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$ , if  $\frac{d[\text{NH}_3]}{dt} = 2 \times 10^{-4} \text{ mol L}^{-1} \text{ s}^{-1}$ , the value of  $\frac{-d[\text{H}_2]}{dt}$  would be

1.  $3 \times 10^{-4} \text{ mol L}^{-1} \text{ s}^{-1}$

2.  $4 \times 10^{-4} \text{ mol L}^{-1} \text{ s}^{-1}$

3.  $6 \times 10^{-4} \text{ mol L}^{-1} \text{ s}^{-1}$

4.  $1 \times 10^{-4} \text{ mol L}^{-1} \text{ s}^{-1}$

125.

Standard free energies of formation (in kJ/mol) at 298 K are  $-237.2$ ,  $-394.4$  and  $-8.2$  for  $\text{H}_2\text{O(l)}$ ,  $\text{CO}_2$

(g) and pentane (g), respectively. The value of  $E_{\text{cell}}$  for the pentane-oxygen fuel cell is

2.  $-\frac{d[B]}{dt}$

3.  $\frac{d[D]}{dt}$

4.  $-\frac{d[A]}{2dt}$

1. 1.968 V
2. 2.0968 V
3. 1.0968 V
4. 0.0968 V

126.

If 60% of a first order reaction was completed in 60 min, 50% of the same reaction would be completed in approximately:

( $\log 4 = 0.60$ ,  $\log 5 = 0.69$ )

1. 50 min
2. 45 min
3. 60 min
4. 40 min

127.

In producing chlorine through electrolysis 100 W power at 125 V is being consumed. How much chlorine per min is liberated? ECE of chlorine is  $0.367 \times 10^{-6}$  kg/C:

1. 17.6 mg
2. 21.3 mg
3. 24.3 mg
4. 13.6 mg

128.

A solution containing 10g per  $\text{dm}^3$  of urea (molecular mass =  $60 \text{g mol}^{-1}$ ) is isotonic with a 5% solution of a non-volatile solute. The molecular mass of this non-volatile solute is :

1.  $25 \text{g mol}^{-1}$ .
2.  $300 \text{g mol}^{-1}$ .
3.  $350 \text{g mol}^{-1}$ .
4.  $200 \text{g mol}^{-1}$ .

129.

For the reaction  
 $2A + B \rightarrow 3C + D$

Which of the following does not express the reaction rate?

1.  $-\frac{d[C]}{3 dt}$

130.

1.00 g of non-electrolyte solute (molar mass  $250 \text{mol}^{-1}$ ) was dissolved in 51.2 g of benzene. If the freezing point depression constant,  $K_f$  of benzene is  $5.12 \text{mol}^{-1}$ , the freezing point of benzene will be lowered by :

1. 0.4 K
2. 0.3 K
3. 0.5 K
4. 0.2 K

131.

During osmosis, flow of water through a semi-permeable membrane is :

1. from solution having higher concentration only
2. from both sides of semi-permeable membrane with equal flow rates
3. from both sides of semi-permeable membrane with unequal flow rates
4. from solution having lower concentration only

132.

A compound is formed by cation C and anion A. The anions form hexagonal close packed (hcp) lattice and the cations occupy 75% of octahedral voids. The formula of the compound is:

1.  $C_4A_3$
2.  $C_2A_3$
3.  $C_3A_2$
4.  $C_3A_4$

133.

Following limiting molar conductivities are given as

$$\lambda_m^0(H_2SO_4) = x \text{ Scm}^2 \text{ mol}^{-1}$$

$$\lambda_m^0(K_2SO_4) = y \text{ Scm}^2 \text{ mol}^{-1}$$

$$\lambda_m^0(CH_3COOK) = z \text{ Scm}^2 \text{ mol}^{-1}$$

$\lambda_m^0$  (in  $\text{Scm}^2 \text{ mol}^{-1}$ ) for  $CH_3COOH$  will be-

1.  $x - y + 2z$
2.  $x + y + z$
3.  $x - y + z$
4.  $\frac{(x-y)}{2} + z$

134.

Formula of nickel oxide with metal deficiency defect in its crystal is  $Ni_{0.98}O$ . The crystal contains  $Ni^{2+}$  and  $Ni^{3+}$  ions. The fraction of nickel existing as  $Ni^{2+}$  ions in the crystal is-

1. 0.96
2. 0.04
3. 0.50
4. 0.31

135.

Equivalent conductance of saturated  $BaSO_4$  solution is  $400 \text{ ohm}^{-1} \text{ cm}^2 \text{ equivalent}^{-1}$  and its specific conductance is  $8 \times 10^{-5} \text{ ohm}^{-1} \text{ cm}^{-1}$ ; hence solubility product  $K_{sp}$  of  $BaSO_4$  is

1.  $4 \times 10^{-8} \text{ M}^2$
2.  $1 \times 10^{-8} \text{ M}^2$
3.  $2 \times 10^{-4} \text{ M}^2$
4.  $1 \times 10^{-4} \text{ M}^2$

136.

Angle between equipotential surface and electric lines of force is-

1. Zero
2.  $180^\circ$
3.  $90^\circ$
4.  $45^\circ$

137.

**Assertion :** An isolated system consists of two particles of equal masses  $m=10 \text{ gm}$  and charges  $q_1 = +1\mu\text{C}$  and

$q_2 = -1\mu\text{C}$  as shown in figure. The initial separation of both charges is  $l=1\text{m}$ . Both the charges are given initial velocities  $v_1 = 1 \text{ m/s}$  and  $v_2 = 2 \text{ m/s}$  towards right. Then the maximum separation between the charges is infinite.



**Reason :** The total energy (Kinetic energy + electrostatic potential energy) of given two particle system is positive and initial velocity of separation is positive.

138.

An electric dipole is placed at an angle of  $30^\circ$  with an electric field intensity  $2 \times 10^5 \text{ N/C}$ . It experiences a torque equal to  $4 \text{ Nm}$ . The charge on the dipole, if the dipole length is  $2 \text{ cm}$ , is

1.  $8 \text{ mC}$
2.  $2 \text{ mC}$
3.  $5 \text{ mC}$
4.  $7 \mu\text{C}$

139.

Maximum charge stored on a metal sphere of radius  $15 \text{ cm}$  may be  $7.5 \mu\text{C}$ . The potential energy of the sphere in this case is-

1.  $9.67 \text{ J}$
2.  $0.25 \text{ J}$
3.  $3.25 \text{ J}$
4.  $1.69 \text{ J}$

140.

The current in a wire varies with time according to the equation  $I = 4 + 2t$ , where  $I$  is in ampere and  $t$  is in sec. The quantity of charge which has passed through a cross-section of the wire during the time  $t = 2 \text{ sec}$  to  $t = 6 \text{ sec}$  will be

1.  $60 \text{ coulomb}$
2.  $24 \text{ coulomb}$
3.  $48 \text{ coulomb}$
4.  $30 \text{ coulomb}$

141.

An electric dipole with dipole moment  $\vec{p} = (3\hat{i} + 4\hat{j}) \times 10^{-30} \text{ C - m}$

is placed in an electric field  $\vec{E} = 4000\hat{i} \text{ (N/C)}$ . An external agent turns the dipole slowly until its electric dipole moment becomes  $(-4\hat{i} + 3\hat{j}) \times 10^{-30} \text{ C - m}$ . The work done by the external agent is equal to :-

1.  $4 \times 10^{-28} \text{ J}$
2.  $-4 \times 10^{-28} \text{ J}$
3.  $2.8 \times 10^{-26} \text{ J}$
4.  $-2.8 \times 10^{-26} \text{ J}$

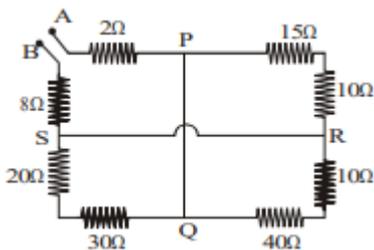
142.

The electric potential due to an infinite sheet of positive charge density  $\sigma$  at a point located at a perpendicular distance  $Z$  from the sheet is : (Assume  $V_0$  to be the potential at the surface of sheet)

1.  $V_0$
2.  $V_0 - \frac{\sigma Z}{\epsilon_0}$
3.  $V_0 + \frac{\sigma Z}{2\epsilon_0}$
4.  $V_0 - \frac{\sigma Z}{2\epsilon_0}$

143.

The equivalent resistance between points A and B is-

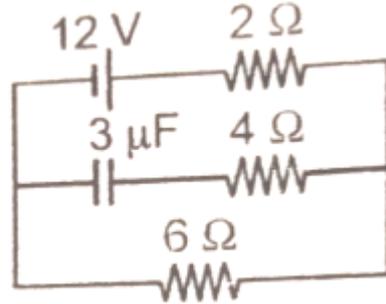


1.  $32.5\Omega$
2.  $22.5\Omega$
3.  $2.5\Omega$

4.  $42.5 \Omega$

144.

The charge on the plates of the capacitor in steady state will be



1.  $3 \mu\text{C}$
2.  $9 \mu\text{C}$
3.  $27 \mu\text{C}$
4.  $36 \mu\text{C}$

145.

Two identical parallel plate capacitors are placed in series and connected to a constant voltage source of  $V_0$  volt. If one of the capacitors is completely immersed in a liquid with dielectric constant  $K$ , the potential difference between the plates of the other capacitor will change to -

1.  $\frac{K+1}{K} V_0$
2.  $\frac{K}{K+1} V_0$
3.  $\frac{K+1}{2K} V_0$
4.  $\frac{2K}{K+1} V_0$

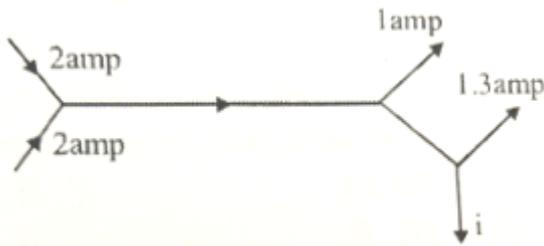
146.

Five equal capacitors connected in series have a resultant capacitance of  $4\mu\text{F}$ . The total energy stored in these when these are connected in parallel and charged to 400 V is -

1. 1 J
2. 8 J
3. 16 J
4. 4 J

147.

The figure below shows currents in a part of the electric circuit. The current 'i' is -



1. 1.7 amp
2. 3.7 amp
3. 1.3 amp
4. 1 amp

148.

When a negative charge is released and moves in the electric field, it moves toward a position of

1. lower electric potential and lower potential energy
2. lower electric potential and higher potential energy
3. higher electric potential and lower potential energy
4. higher electric potential and higher potential energy

149.

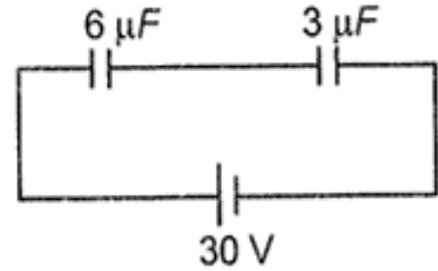
The direction of the Electric field at point C due to charge  $q$  and  $-2q$  at points A and B such that C is a point on the perpendicular bisector of AB above line AB and charge  $q$  is negative-



1. ←
2. ↙
3. ↖
4. →

150.

Two capacitor of capacitance  $6 \mu F$  and  $3 \mu F$  are connected in series with battery of 30 V. Charge on  $3 \mu F$  capacitor at steady state is-



1.  $3 \mu C$
2.  $1.5 \mu C$
3.  $60 \mu C$
4.  $900 \mu C$

151.

A point charge  $q$  is placed at a distance  $\frac{R}{3}$  from the center O of an uncharged, conducting hollow sphere of inner radius R and outer radius  $3R$ . The potential at the center

is  $\left( K = \frac{1}{4\pi\epsilon_0} \right)$

1.  $\frac{7 Kq}{3 R}$
2.  $\frac{5 Kq}{3 R}$
3.  $\frac{3Kq}{R}$
4.  $\frac{Kq}{R}$

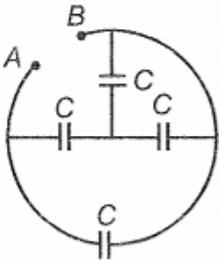
152.

The electric field intensity and the electric potential at a point are E and V respectively. Which of the following is correct?

1. If  $E \neq 0$ , V cannot be zero
2. If  $V \neq 0$ , E cannot be zero
3. If V is constant and non-zero, E must be zero
4. If  $V=0$ , E must be zero

153.

The equivalent capacitance across A and B in the given figure is



1.  $\frac{3}{2}C$
2.  $C$
3.  $\frac{2}{3}C$
4.  $\frac{5}{3}C$

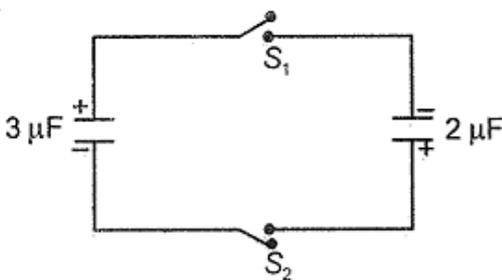
154.

Surface charge density on the positive plate of a charged parallel plate capacitor is  $\sigma$ . Energy density in the electric field of the capacitor is:

1.  $\frac{\sigma^2}{\epsilon_0}$
2.  $\frac{\sigma^2}{2\epsilon_0}$
3.  $\frac{\sigma}{\epsilon_0}$
4.  $2\sigma^2\epsilon_0$

155.

Two capacitors of capacity  $2 \mu F$  and  $3 \mu F$  are charged to same potential difference 6 V. Now they are connected with opposite polarity as shown. After closing switches  $S_1$  and  $S_2$ , their final potential difference becomes-



1. Zero
2.  $\frac{4}{3}V$

3. 3 V

4.  $\frac{6}{5}V$

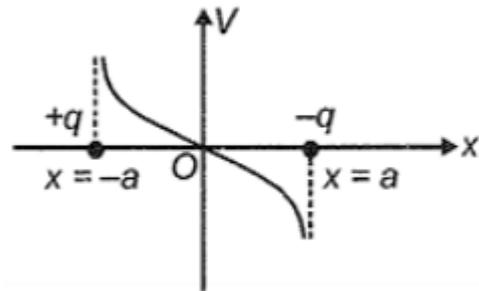
156.

How many capacitors each of  $8 \mu F$  and 250 V are required to form a composite capacitor of  $16 \mu F$  and 1 kV?

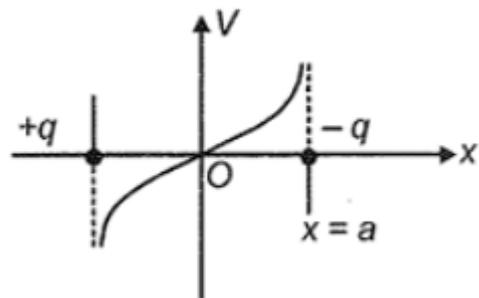
1. 16
2. 8
3. 64
4. 32

157.

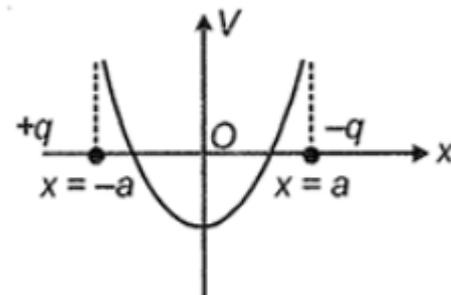
A positive charge  $q$  and a negative charge  $-q$  are placed at  $x = -a$  and  $x = +a$  respectively. The variation of  $V$  along  $x$ -axis is represented by the graph-



1.

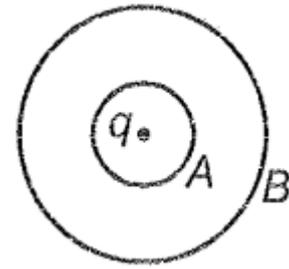
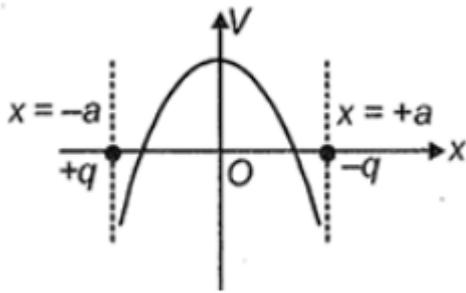


2.



3.

4.



158.

Which of the following statements is correct regarding electrostatics of conductors?

1. The interior of the conductor with no cavity can have no excess charge in the static situation
2. Electrostatic potential is constant throughout the volume of the conductor
3. Electrostatic potential has same value inside as that on its surface
4. All of these

159.

Two charges placed in the air at a distance of 1 m exert force 'F' on each other. If these charges are placed inside mica at the same distance, then the new net force between charges is-

1.  $> F$
2.  $< F$
3.  $= F$
4. Depends on the area of the slab

160.

A ring of radius R is having a uniform line charge density ' $\lambda$ '. The electric field at the center of the ring is-

1. Zero
2. not defined
3.  $\frac{\lambda}{2\pi\epsilon_0 R^2}$
4.  $\frac{\lambda}{4\pi\epsilon_0 R}$

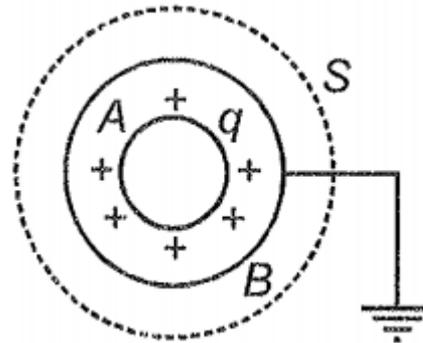
161.

The ratio of the electric flux linked with shell A and shell B in the diagram shown below is-

1. 1: 1
2. 1: 2
3. 1: 4
4. 4: 2

162.

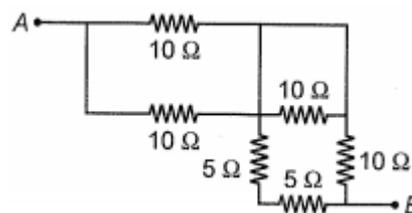
If the following diagram the shell A is given a charge q and B is earthed. The electric flux linked with the Gaussian surface S is-



1.  $\frac{q}{\epsilon_0}$
2.  $\frac{q}{2 \epsilon_0}$
3.  $\frac{2 q}{\epsilon_0}$
4. Zero

163.

Resistance between terminals A and B is-



1.  $5 \Omega$
2.  $15 \Omega$

3.  $10 \Omega$

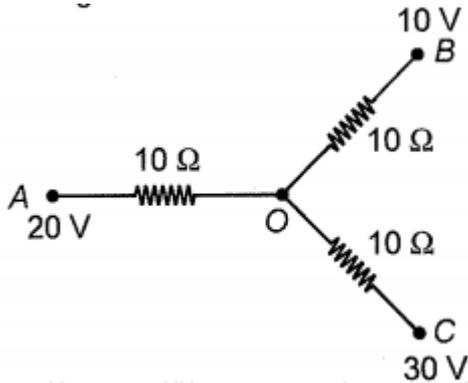
4.  $20 \Omega$

3. 69%

4. Zero

164.

Current through the branch AO is-



1. 2 A

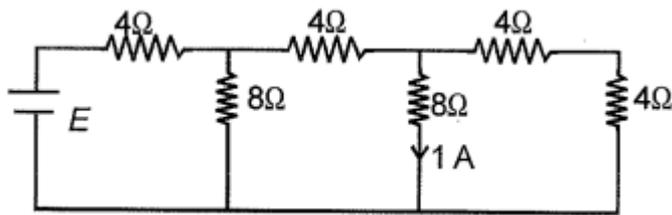
2. 4 A

3. 1 A

4. Zero

165.

The value of E (emf of cell) is-



1. 24 V

2. 32 V

3. 16 V

4. 8 V

166.

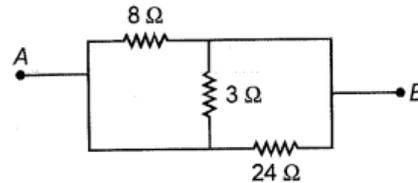
What is the percentage increase in the resistance of a wire when it is stretched so that its length increases by 30%? (Assume that there is no change in the temperature and the volume of the wire)

1. 60%

2. 15%

167.

The effective resistance of the network between points A and B is-



1.  $3 \Omega$

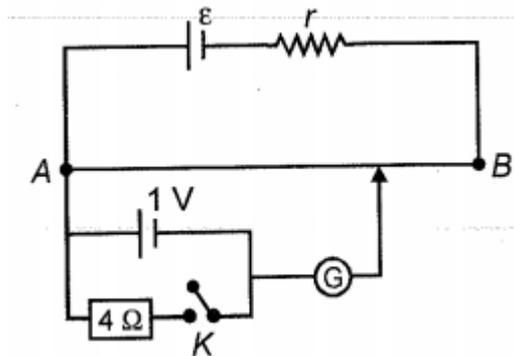
2.  $2 \Omega$

3.  $4 \Omega$

4.  $33 \Omega$

168.

Figure shows a potentiometer used for determination of internal resistance of a cell of emf 1 V. When key K is open, the balance point is obtained at 90 cm from A and when closed, the balance point shifts to 80 cm from A. The internal resistance of the cell must be-



1.  $0.5 \Omega$

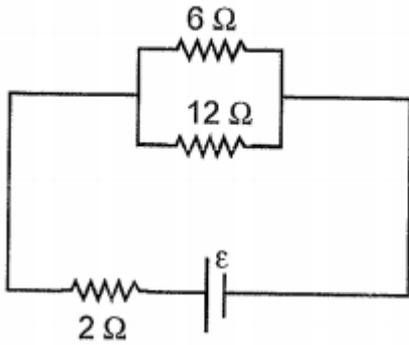
2.  $4 \Omega$

3.  $1 \Omega$

4.  $2 \Omega$

169.

In the circuit shown in figure, the power developed in  $6 \Omega$  resistor is 24 W. The power developed in  $2 \Omega$  resistor will be-



1. 16 W
2. 18 W
3. 6 W
4. 3 W

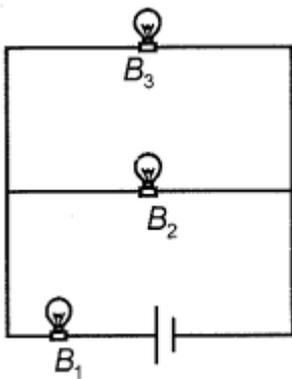
170.

A heater coil is used across a constant voltage source. If the heater wire is cut into two equal parts and one part is applied across the same source, then the heat produced in it will be-

1. Halved
2. Doubled
3. Quartered
4. Quadrupled

171.

In the given circuit diagram, 3 identical bulbs are connected. If bulb  $B_3$  get fused suddenly, how the brightness of bulbs  $B_1$  and  $B_2$  will change?

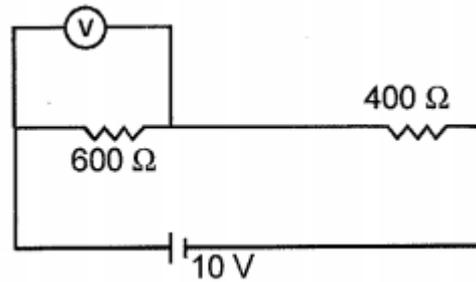


1. Brightness of bulb  $B_1$  will increase whereas brightness of bulb  $B_2$  will decrease
2. Brightness of bulb  $B_2$  will increase whereas brightness of bulb  $B_1$  will decrease

3. Brightness of both bulbs  $B_1$  and  $B_2$  increase
4. Brightness of bulb  $B_1$  will increase whereas brightness of bulb  $B_2$  will be same

172.

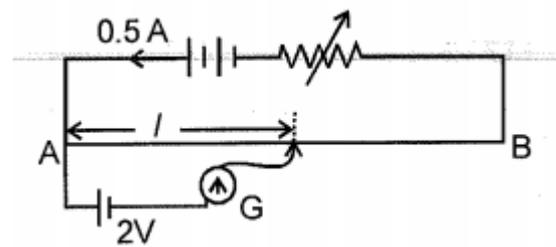
What is the reading of the voltmeter of resistance  $1200 \Omega$  connected in the following circuit diagram?



1. 2.5 V
2. 5.0 V
3. 7.5 V
4. 40 V

173.

For what value of the length  $l$ , the deflection in the galvanometer will be zero in the following potentiometer arrangement? The length of the wire AB is 4 m and its resistance is  $10 \Omega$ ?

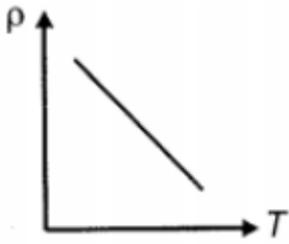
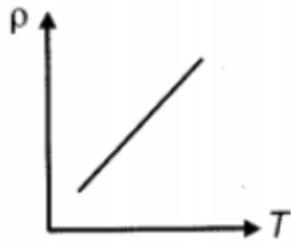


1. 0.8 m
2. 1.6 m
3. 2.4 m
4. 3.6 m

174.

The temperature ( $T$ ) dependence of resistivity ( $\rho$ ) of a semiconductor is roughly represented by-

- 1.



2.



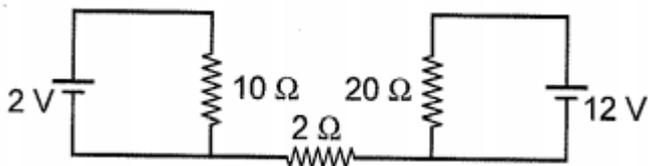
3.



4.

175.

Current through the  $2\Omega$  resistance in the electrical network shown is-

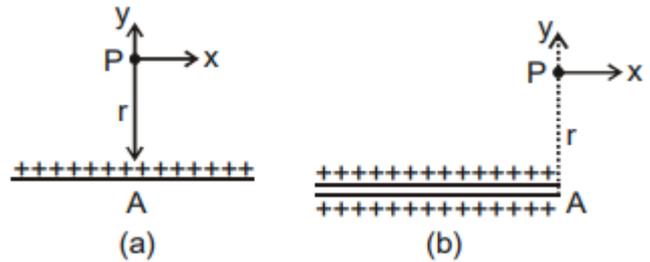


1. Zero
2. 1 A
3. 3 A
4. 5 A

176.

Electric field due to an infinite line of charge as shown in figure (a) at a point P at a distance r from the line is E.

If the wire is folded at point A so that both parts lie alongside as shown in figure (b), then express electric field at P in vector form.



1.  $\frac{E}{2}\hat{i} + \frac{E}{2}\hat{j}$
2.  $E\hat{i} + E\hat{j}$
3.  $\sqrt{2}E\hat{i} + \sqrt{2}E\hat{j}$
4.  $\frac{E}{\sqrt{2}}\hat{i} + \frac{E}{\sqrt{2}}\hat{j}$

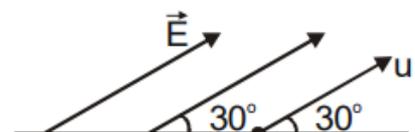
177.

Two heating coils, one of fine wire and the other of thick wire of the same material and of the same length are connected in series and in parallel. Which of the following statements is correct?

1. In series, fine wire liberates more energy while in the parallel thick wire will liberate more energy
2. In series, fine wire liberates less energy while in the parallel thick wire will liberate more energy
3. Both will liberate equally
4. In series, the thick wire will liberate more energy while in parallel it will liberate less energy

178.

In a region an electric field  $E = 15 \text{ NC}^{-1}$  making an angle  $30^\circ$  with the horizontal plane is present. A ball having charge 2 C and mass 3 kg is projected with speed 20 m/s at an angle  $30^\circ$  with the horizontal, the horizontal range of the projectile in metre is:- ( $g = 10 \text{ ms}^{-2}$ )



1. 40

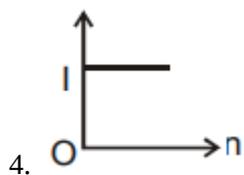
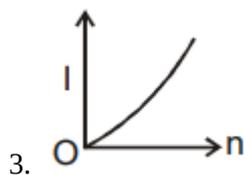
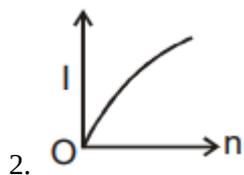
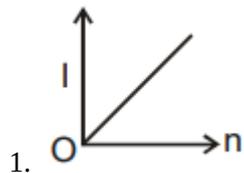
2.  $20\sqrt{3}$

3.  $40\sqrt{3}$

4.  $80\sqrt{3}$

179.

A battery consists of a variable number  $n$  of identical cells having equal internal resistance connected in series. The terminals of the battery are short-circuited and the current  $I$  measured. Which one of the graphs below shows the correct relationship between  $I$  and  $n$ ?



180.

A sphere encloses an electric dipole with charges  $\pm 3 \times 10^{-6}C$ . What is the total electric flux through the sphere?

1.  $-3 \times 10^{-6}$

2. zero

3.  $3 \times 10^{-6} Nm^2/C$

4.  $6 \times 10^{-6} Nm^2/C$

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