

1.

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

2.

In lactational amenorrhoea, there is no ovulation or menstruation during the period of intense lactation following parturition, due to high level of prolactin, which?

1. Inhibits the release of gonadotropins
2. Inhibits the release of estrogen and progesterone
3. Stimulate the release of FSH and LH
4. Stimulates the release of estrogen and progesterone

3.

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

4.

Which of the following STD and its causative agent is not correctly matched?

1.	Genital warts	:	Haemophilus ducreii
2.	Syphilis	:	Treponema pallidum
3.	Genital herpes	:	Type II herpes simplex virus (HSV-2)
4.	trichomoniasis	:	Trichomonas vaginalis

5.

All the following statements about ZIFT are correct, but one is wrong. Which one is wrong?

1. It is zygote intra fallopian transfer
2. Zygote is transferred into the fallopian tube

about after IVF

3. Early embryos upto 8 blastomeres can also be transferred into the fallopian tubes

4. Embryos with more than 8 blastomeres are also transferred into the fallopian tubes

6.

In the human female, menstruation can be deferred by the administration of

1. FSH only
2. LH only
3. Combination of FSH and LH
4. Combination of estrogen and progesterone

7.

In human, cleavage divisions are

1. Slow and synchronous
2. Fast and synchronous
3. Slow and asynchronous
4. Fast and asynchronous

8.

A : In morula stage the cells divide without any increase in size without any increase in size

R : Zone pellucida remains intact till cleavage is completed

9.

The extra embryonic membranes of the mammalian embryo are derived from

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

10.

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

11.

A change in the amount of yolk and its distribution in the egg will affect :

1. Pattern of cleavage
2. Number of blastomeres produced
3. Fertilization
4. Formation of zygote

12.

Capacitation refers to changes in the

1. Sperm after fertilization
2. Sperm before fertilization
3. Ovum before fertilization
4. Ovum after fertilization

13.

In which type of placenta minimum number of barrier is/are present between foetal and maternal blood?

1. Syndesmochorial
2. Haemochorial
3. Haemoendothelial
4. Endotheliochorial

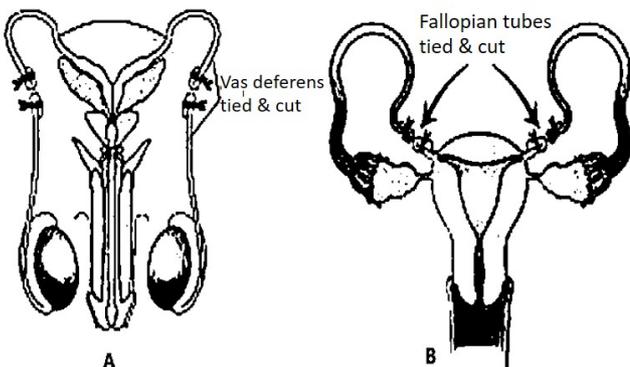
14.

Drugs such as Thalidomide taken by woman in first trimester of pregnancy cause all the following malformations in the developing embryo except

1. Phocomelia
2. Amelia
3. Heart disorder
4. Placentitis

15.

Consider the two surgical procedures given below and choose the correct statement:



2. A is a more difficult procedure than B
3. The reversibility of A is good but that of B is very poor
4. A will make the male impotent and B will make the female infertile
5. Both A and B can be called as sterilization procedures

16.

The genetic material must show variation. Which of the following is NOT an example of genetic variation?

1. New mutations can occur during meiosis.
2. Different species have different numbers of chromosomes.
3. Different individuals within a species have different phenotypes.
4. Individuals of different species may have similar phenotypes.

17.

Why might heat-killed bacteria be useful as a vaccine?

1. It can cause a lethal infection.
2. Heat degradation of proteins changes their shape.
3. Molecules from the cell surface are still intact and can provoke an immune response.
4. DNA molecules can transform other strains of bacteria.

18.

Why was the DNase treatment used by Avery, MacLeod, and McCarty an important step?

1. This allowed them to isolate pure DNA samples.
2. This allowed them to isolate pure protein samples.
3. This allowed them to demonstrate that removing the DNA prevents transformation.
4. This allowed them to demonstrate that mixing rough cells with DNA prevents transformation.

19.

What key characteristic of T2 bacteriophage allowed Hershey and Chase to use it in their studies of the genetic material?

1. Its genes encode proteins that assemble to produce the viral coat.
2. It injects its genetic material into a bacterial cell.
3. It can undergo either the lytic or lysogenic life cycle.
4. It enters the bacterial cell to cause infection.

20.

Which of the following statements about the structure of DNA is incorrect?

1. One complete turn requires 3.4nm and 10 base pairs.
2. The backbones of each strand run in opposite directions relative to each other.
3. Each pair of nucleotides is held together by three hydrogen bonds.
4. The width of the molecule is a constant 2nm.

21.

Which of the following structures of a eukaryotic chromosome is not primarily composed of DNA?

1. Telomeres.
2. Origin of replication.
3. Kinetochores.
4. Centromere.

22.

Which statement about bacterial DNA replication is correct?

1. DNA replication begins at several places along the chromosome.
2. DNA replication begins at the origin and travels in both directions.
3. DNA replication begins at the origin and travels around the chromosome back to the origin.
4. DNA replication begins at a GC rich region of the chromosome.

23.

What is a key difference between DNA pol III and DNA ligase?

1. Only DNA polIII synthesizes phosphoester bonds.
2. Only DNA ligase synthesizes phosphoester bonds.
3. DNA polIII can synthesize DNA from 3'-5'.
4. DNA ligase can use energy from ATP rather than nucleotides.

24.

Which statement could NOT describe both eukaryotic and prokaryotic transcription?

1. Promoter elements in the DNA are required for polymerase binding.
2. Transcription factors control the binding of RNA polymerase.
3. RNA polymerase opens a double stranded DNA to expose the template strand.
4. RNA polymerase catalyzes RNA synthesis from 3' to 5' of the new strand

25.

Which of these is an enzymatic function of the ribosome?

1. Polynucleotide kinase.
2. Base pair recognition.
3. Methyl transferase.
4. Peptidyl transferase.

26.

Which of the following facts is the most important evidence that the genetic code is a triplet code?

1. Insertions or deletions caused significant defects in protein structure.
2. The effect of single insertions could be remedied by single deletions nearby.
3. Two nearby insertions caused significant defects in protein structure.
4. Three insertions near each other often led to minor defects in protein structure.

27.

Which of the following would you expect to find in an inducible system?

1. A repressor protein, which is bound to DNA in absence of any other factor.
2. A repressor protein, which is bound to DNA in the presence of a corepressor.
3. An activator protein, which is bound to DNA in absence of any other factor.
4. An activator protein, which is bound to DNA only in the absence of an inhibitor.

28.

The famous double helix model of DNA was proposed by Watson and Crick in ____ and they shared Nobel Prize for Physiology or Medicine in _____ for their effort.

1. 1951, 1971
2. 1943, 1963
3. 1953, 1962
4. 1969, 1972

29.

Which of the following was not a character studied by Mendel in garden pea?

1. Flower position
2. Pod shape
3. Flower colour
4. Pod position

30.

A genetic cross between homozygous individuals

but with different alleles for a single gene of interest is called as:

1. A reciprocal cross
2. Monohybrid cross
3. Dihybrid cross
4. Test cross

31.

What proportion of progeny in F₂ generation in a Mendel monohybrid cross resembled the parent [of P generation] that expressed the recessive trait?

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

32.

In a test cross, the plant expressing the dominant phenotype is crossed with the plant:

1. Which is heterozygous dominant
2. Which is heterozygous recessive
3. Which is homozygous recessive
4. Which is homozygous dominant

33.

A heterozygous plant produces:

1. Only one kind of gamete
2. Two kinds of gametes each having one allele with equal proportion.
3. Two kinds of gametes each having two alleles with equal proportion.
4. Two kinds of gametes each having one allele with one allele occurring in more gametes than the other.

34.

What is the F₂ phenotypic ratio in cases of incomplete dominance?

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

35.

Blood group antigens are:

1. Carbohydrates present in plasma
2. Carbohydrates present on the surface of RBCs
3. Plasma proteins

4. Proteins present on the surface of RBCs

36.

What can be the blood groups of progeny whose father and mother are of AB and O blood group respectively?

1. A and B only
2. AB only
3. All except O
4. A, B, AB and O

37.

To study whether a gene exhibits multiple allelism or not one must study:

1. An individual
2. A population
3. A species
4. With concentration

38.

Occasionally, a single gene product may produce more than one effect. Such a gene is said to be:

1. Pleiotropic
2. Polygenic
3. Psuedoallele
4. Housekeeping

39.

'When two pairs of traits are combined in a hybrid, segregation of one pair of characters is independent of the other pair of characters'. This is the statement of:

1. Law of Dominance
2. Law of segregation
3. Law of Independent Assortment
4. Law of Linkage

40.

Mendel's work remained unrecognised till 1900. Which of the following was not a reason for this?

1. His work was widely publicised and it brought bad name to Mendel
2. His concept of factors as stable and discrete units that did not 'blend' was not accepted.
3. His approach of using mathematics to explain biological phenomena was unacceptable.
4. He could not provide any physical proof for the existence of factors or say what they were made of.

41.

“Chromosomes, which are seen in all dividing cells and pass from one generation to the next, are the basis for all genetic inheritance”.

This statement is credited to:

1. Watson and Crick
2. Hershey and Chase
3. Sutton and Boveri
4. Meselson and Stahl

42.

When the two genes in a dihybrid cross are situated on the same chromosome:

1. The proportion of parental gene combinations was much higher than the non-parental type.
2. The proportion of parental gene combinations was much lesser than the non-parental type.
3. The proportion of parental gene combinations was equal to the non-parental type.
4. Only recombinants are formed.

43.

The mechanism of sex determination in grasshoppers is:

1. XX – XY; male heterogamety
2. XX – XY; female heterogamety
3. XX – XO; male heterogamety
4. XX – XO; female heterogamety

44.

During his observation of spermatogenesis in few insects, Henking found that a nuclear structure was received by 50 % of the sperms. He called this structure as:

1. X – body
2. Y – body
3. X – chromosome
4. Y – chromosome

45.

It is unfortunate that in our society women are blamed for producing female children and have been ostracised and ill-treated because:

1. The sex is determined by the type of sperm fertilizing the egg
2. The sex is determined by the type of egg fertilizing the sperm
3. The sex is determined by the hormones produced by the fetus
4. The sex is determined by the God's Will

46.

Mendelian disorders are mainly determined by:

1. Alteration or mutation in the single gene.
2. Chromosomal gross structural changes.
3. Recombination between linked genes.
4. Jumping genes

47.

The family pedigree of Queen Victoria shows a number of haemophilic descendents as she was:

1. Affected by the disease
2. Carrier for the disease
3. Did not carry the allele for hemophilia
4. Was not a queen

48.

Which of the following is a pyrimidine base found in DNA?

1. Adenine
2. Guanine
3. Uracil
4. Cytosine

49.

In a strand of a nucleic acid. Two nucleotides are linked together by:

1. 3' – 5' phosphodiester bond
2. 5' – 3' phosphodiester bond
3. 2' – 5' phosphodiester bond
4. 3' – 1' phosphodiester bond

50.

The backbone of a polynucleotide chain is made of:

1. Sugar and nitrogenous bases
2. Phosphate and nitrogenous bases
3. Sugar and phosphate
4. Sugar, phosphate and nitrogenous bases

51.

According to Erwin Chargaff, for a double stranded DNA

1. The ratios between Adenine and Thymine, and , Guanine and Cytosine are constant and equals one.
2. The ratios between Adenine and Thymine, and , Guanine and Cytosine are constant but is not equal to one.
3. The ratios between Adenine and Guanine, and , Thymine and Cytosine are constant and equals one.
4. The ratios between Adenine and Guanine, and , Thymine and Cytosine are constant

but is not equal to one.

52.

Histones are:

1. Positively charged and basic amino acids
2. Negatively charged and basic proteins
3. Positively charged and acidic proteins
4. Not found in bacteria

53.

Transcriptionally active chromatin is termed as:

1. Heterochromatin
2. Euchromatin
3. Prechromatin
4. Prochromatin

54.

In Griffith experiment, which of the following bacterial strains were capable of causing pneumonia in mice?

1. Live R
2. Bacteria strain with polysaccharide coat
3. Heat Killed S
4. Live R without capsule and Heat Killed S

55.

The unequivocal proof that DNA is the genetic material was provided by:

1. Avery, Macleod and McCarty
2. Hershey and Chase
3. Meselson and Stahl
4. Watson and Crick

56.

A molecule that can act as a genetic material must fulfill all the following criteria except:

1. It should be able to generate its replica
2. It should chemically and structurally be stable
3. It should provide scope for rapid mutations
4. It should be able to express itself in the form of "Mendelian Characters"

57.

Reverse transcriptase is a:

1. DNA dependent RNA polymerase
2. RNA dependent DNA polymerase
3. RNA dependent RNA polymerase
4. DNA dependent DNA polymerase

58.

DNA replication is correctly described as:

1. Semi-conservative and Continuous
2. Semi-conservative and Discontinuous
3. Conservative and Continuous
4. Semi-conservative and Semi-discontinuous

59.

In a transcription unit, with respect to structural gene, the promoter is located:

1. Upstream and 5'
2. Upstream and 3'
3. Downstream and 5'
4. Downstream and 3'

60.

In most prokaryotes the transcription unit is:

1. Mono-cistronic
2. Poly-cistronic
3. Multi-cistronic
4. Uni-cistronic

61.

The releasing and inhibiting hormones synthesized by hypothalamus are transported from the hypothalamus to the anterior pituitary by way of:

1. the general bloodstream
2. a portal system of blood vessels
3. axons that are present in the pituitary stalk or infundibulum
4. transport carrier proteins present in the CSF

62.

Which of the following correctly describes a negative feedback system?

1. As hormone levels rise, hormone release is promoted.
2. Target organ effects inhibit further hormone release.
3. As hormone levels decrease, hormone release is promoted.
4. As hormone levels decrease, hormone release is inhibited.

63.

All the following are a type of stimulus to trigger endocrine glands to manufacture and release their hormones except:

1. hormonal stimuli
2. neural stimuli
3. permissive stimuli
4. humoral stimuli

64.

- A deficiency of both glucocorticoids and mineralocorticoids will cause:
1. Cushing's syndrome
 2. Conn's syndrome
 3. Graves' disease
 4. Addison's disease
- 65.
- Which of the following is not a metabolic function of human Growth Hormone?
1. Promotes use of blood glucose by body cells
 2. Promotes protein anabolism
 3. Promotes lipolysis
 4. Promotes gluconeogenesis in liver
- 66.
- In spite of a high level of prolactin during pregnancy, milk production does not start because:
1. A high prolactin level inhibits the secretion of GnRH
 2. High levels of progesterone are present during pregnancy
 3. High hCG levels do not allow mammary alveoli to function
 4. The receptors for prolactin are downgraded during pregnancy
- 67.
- Which of the following hormones will be antagonistic to insulin in its effects on carbohydrate, fat and protein metabolism?
1. Cortisol
 2. Glucagon
 3. Human Growth Hormone
 4. Thyroxin
- 68.
- A medical condition that is most likely to be associated with a relative deficiency of vitamins would be:
1. Hyperthyroidism
 2. Acromegaly
 3. Cretinism
 4. Diabetes mellitus
- 69.
- You would expect an enlarged and abnormal thymus gland in patients of:
1. HIV
 2. SCID
 3. Cushing's disease
 4. Myasthenia gravis
- 70.
- A potentially life threatening respiratory failure can occur in cases of severe:
1. hyperparathyroidism
 2. hyperthyroidism
 3. hypothyroidism
 4. hypoparathyroidism
- 71.
- Which of the following hormones may be used in cases of sleep disturbances such as due to a jet-lag?
1. Adrenaline
 2. Thymosin
 3. Melatonin
 4. Thyroxin
- 72.
- An action potential for a given axon is:
1. different in size each time it occurs
 2. always the same size
 3. larger when the information is to be carried faster
 4. smaller when information goes to a gland rather than a muscle
- 73.
- The axons of invertebrate animals do not have myelin sheaths. This is compensated by having:
1. very long axons
 2. very short axons
 3. axons of very large diameter
 4. axons of very small diameter
- 74.
- Alzheimer's disease is characterized by all the following except:
1. toxic beta amyloid peptide build up in brain
 2. shrinkage of all the brain tissue
 3. increased levels of acetylcholine in the basal forebrain
 4. tau protein abnormalities
- 75.
- Sorting and editing of sensory impulses to cerebrum takes place in:
1. pons
 2. cerebellum
 3. thalamic nuclei
 4. hypothalamus
- 76.
- Pons:
1. acts to regulate body temperature
 2. provides motor signals to the cerebrum
 3. controls vomiting and coughing
 4. contains nuclei that relay information from the cerebrum to cerebellum
- 77.
- Area of the brain, most involved in maintaining the body's homeostasis, is:

1. medulla oblongata
2. cerebellum
3. pons
4. hypothalamus

78.

If you visually follow a moving object, the part of the brain that coordinates head and eye movements will be:

1. occipital cortex
2. superior colliculi
3. cerebellum
4. thalamus

79.

Cerebral aqueduct passes through the:

1. Mid brain
2. Diencephalon
3. Hind brain
4. Spinal cord

80.

Sympathetic stimulation does not lead to:

1. increased respiratory rate
2. activation of energy reserves
3. increased metabolic rate
4. increased storage of lipid and glycogen

81.

Bipolar neurons are found in:

1. Olfactory membrane
2. Choroid of eye
3. Dorsal root ganglion of spinal nerves
4. Cerebellar peduncles

82.

Parasympathetic stimulation does not result in:

1. sexual arousal and stimulation of sexual glands
2. constriction of respiratory passageways
3. dilation of the pupils
4. an increase in smooth muscle activity along the digestive tract

83.

A motor neuron and all the muscle fibers it supplies is called:

1. motor unit
2. neuromuscular junction
3. motor end plate
4. fascicle

84.

After its release at the neuromuscular junction, Acetylcholine binds to the motor end plate causing a change in membrane permeability to:

1. potassium

2. calcium
3. sodium
4. magnesium

85.

A feature unique to smooth muscles is the presence of:

1. T tubules
2. multiple nuclei
3. Calmodulin
4. myosin and actin filaments

86.

If production of pyruvic acid by anaerobic metabolism in a muscle is faster than it can be utilized, the surplus is converted to:

1. lactic acid
2. adenosine diphosphate
3. carboxylic acid
4. creatine phosphokinase

87.

Immunosuppression can be a treatment option in cases of:

1. Muscular dystrophy
2. Myasthenia gravis
3. Osteoporosis
4. Gouty arthritis

88.

Identify the incorrectly matched pair:

	Joint type	Example
1.	Hinge	Knee
2.	Pivot	Between atlas and axis vertebra
3.	Gliding	Between the metacarpals
4.	Saddle	Between carpal and metacarpal of thumb

89.

The number of which of the following would normally be equal in human skeleton?

1. Vertebrochondral ribs and digits in both upper limbs
2. Bones in cranium and the facial skeleton
3. Carpals and tarsals
4. Vertebrosteral ribs and digits in one lower limb

90.

The human ribs are termed as 'bicephalic' because:

1. They attach to other bones both dorsally and ventrally
2. They have two articulation surfaces on their dorsal end
3. They have two articulation surfaces on their ventral end
4. They articulate with the help of cartilage at both ends

91.

Maximum -I effect is exerted by the group

1. $C_6H_5 -$
2. $-OCH_3$
3. $-Cl$
4. $-NO_2$

92.

Zero inductive effect is exerted by -

1. $C_6H_5 -$
2. $H -$
3. $CH_3 -$
4. $Cl -$

93.

Pair of groups exerting (-I) effect is -

1. $-NO_2$ & $-CH_3$
2. $-NO_2$ & $-Cl$
3. $-Cl$ & $-CH_3$
4. $-CH_3$ & $-C_2H_5$

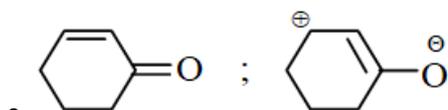
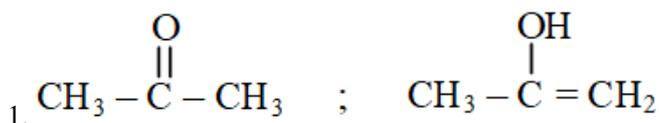
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M effect takes part in -

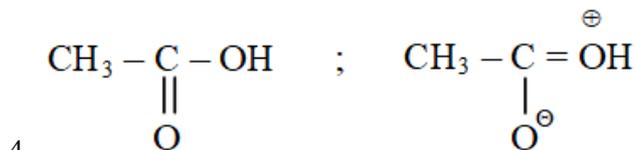
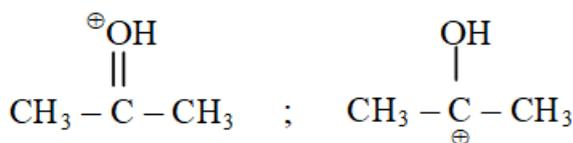
1. Saturated system
2. Unsaturated system containing conjugated double bond.
3. Unsaturated system containing non conjugated double bond.
4. A triple bond in a carbon chain

95.

Which of the following pairs of structures do not represent resonating structures ?

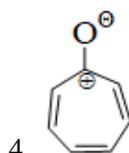
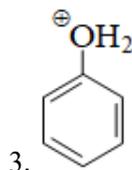
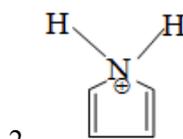
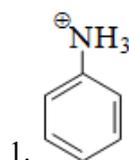


3.



96.

In which delocalization of positive charge is possible



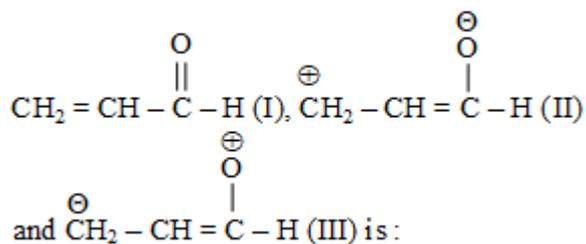
97.

The o, p-directing but deactivating group is

1. $-NH_2$
2. $-OH$
3. $R - (alkyl)$
4. $X - (Halogen)$

98.

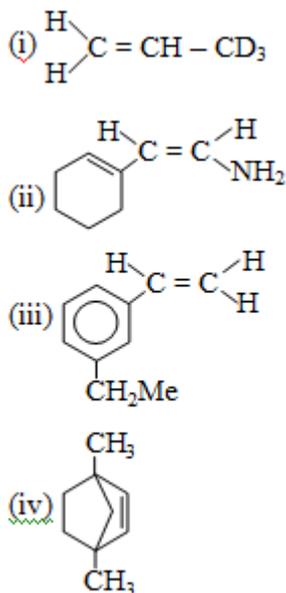
The order of stability of the following resonating structures



1. II > I > III 2. I > III > II
3. I > II > III 4. III > II > I

99.

Hyperconjugation is possible in -



1. i and ii
2. i, ii and iii
3. only ii
4. in all

100.

Which of the following groups has the highest hyperconjugative effect but least + I-effect ?

1. -CH₃ 2. -CH₂CH₃
3. -CH(CH₃)₂ 4. -C(CH₃)₃

101.

The heat of hydrogenation of benzene is 51 kcal/mol and its resonance energy is 36 kcal/mol. What will be the heat of hydrogenation of cyclohexene ?

1. 18 kcal mol⁻¹ 2. 29 kcal mol⁻¹

3. 50 kcal mol⁻¹ 4. 26 kcal mol⁻¹

102.

Which of the following is not paramagnetic -

1. Carbon free radical 2. Singlet carbene
3. Triplet carbene 4. All

103.

Which of the following are diamagnetic -

1. Carbocation 2. Carbanion
3. Singlet carbene 4. All

104.

Arrange the following nucleophiles in the order of their nucleophilic strength :

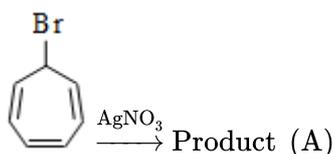
1. OH⁻ > CH₃COO⁻ > OCH₃⁻ > C₆H₅O⁻
2. CH₃COO⁻ < C₆H₅O⁻ < CH₃O⁻ < OH⁻
3. C₆H₅O⁻ < CH₃COO⁻ < CH₃O⁻ < OH⁻
4. CH₃COO⁻ < C₆H₅O⁻ < OH⁻ < CH₃O⁻

105.

Which order is untrue for resonance energy

1. > H₂CO₃
2. > CH₂ = CH - CH₂⁻
3. > CH₃ - CH₂⁺
4. < CH₂ = CH - CH = CH₂

106.



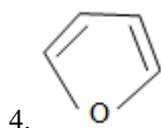
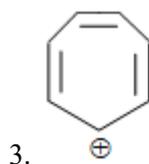
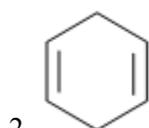
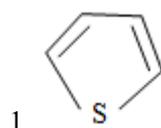
Select the correct statement about product (A)

1. Product is aromatic

2. Product has high dipole moment
3. Product has less resonance energy
4. Both A and B

107.

Which of the following is not an aromatic compound -



108.

In which of the following molecules, the substituent does not exert its resonance effect?

- | | |
|-----------------|-------------------|
| 1. $C_6H_5NH_2$ | 2. $C_6H_5NH_3^+$ |
| 3. C_6H_5OH | 4. C_6H_5Cl |

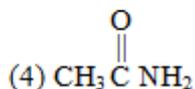
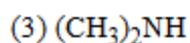
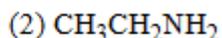
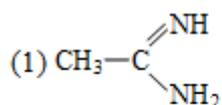
109.

Which is strongest acid -

1. Ortho iodo benzoic acid
2. Ortho bromo benzoic acid
3. Ortho chlorobenzoic acid
4. Ortho fluoro benzoic acid

110.

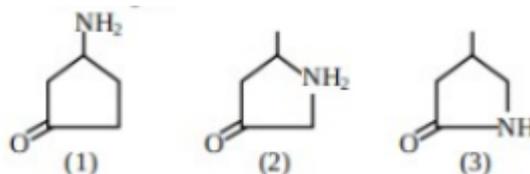
The correct order of basicities of the following compounds is -



- | | |
|--------------------|--------------------|
| 1. $2 > 1 > 3 > 4$ | 2. $1 > 3 > 2 > 4$ |
| 3. $3 > 1 > 2 > 4$ | 4. $1 > 2 > 3 > 4$ |

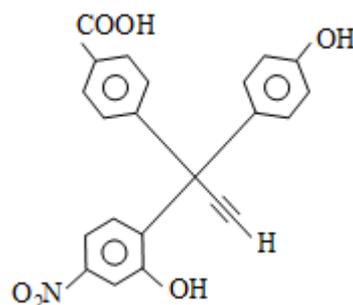
111.

Arrange the following compounds according to decreasing order of basic strength

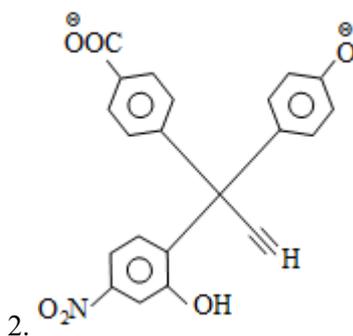
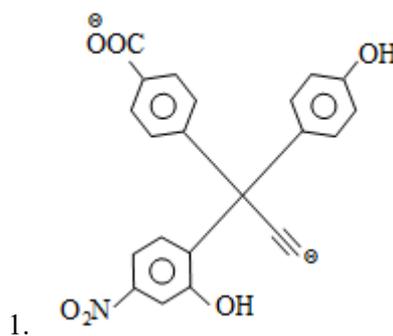


1. $2 > 1 > 3$
2. $1 > 2 > 3$
3. $2 > 3 > 1$
4. $3 > 2 > 1$

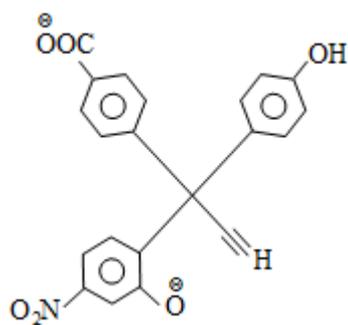
112.



when X is made to react with 2 eq. of $NaNH_2$ the product formed will be:



3.



3. OK^+ 4. RO^-

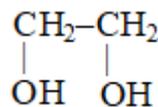
116.

The reduction of 4-octyne with H_2 in the presence of Pd/CaCO_3 – quinoline gives (as a major product) -

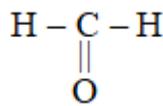
1. trans-4-octene
2. cis-4-octene
3. a mixture of cis and trans-4-octene
4. a completely reduced product C_8H_{18}

117.

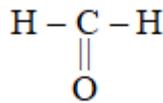
What would be the product when ethene is oxidised with cold dil. KMnO_4 solution -



1.



2.



3.

4. $\text{CO}_2 + \text{H}_2\text{O}$

118.

Propene react with Cl_2 at 500°C the product is formed -

1. 1-chloro propene-1
2. 2-chloro propene-1
3. 1,2-dichloro propane
4. 3-chloro propene-1

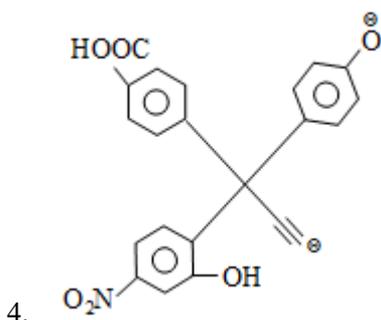
119.

Which of the following will not react with an ammonical silver nitrate solution -

1. $\text{CH}_3\text{C}\equiv\text{CH}$ 2. $(\text{CH}_3)_2\text{CH}-\text{C}\equiv\text{H}$
3. $\text{CH}_3\text{C}\equiv\text{CCH}_3$ 4. $\text{HC}\equiv\text{CH}$

120.

Consider the following reactions

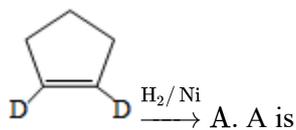


113.

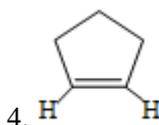
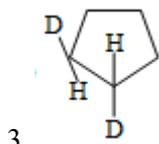
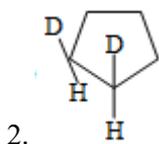
The no. of isomeric sodium salt that will be required to obtain neopentane.

1. 3 2. 1
3. 4 4. 6

114.



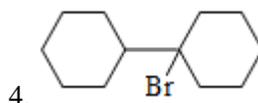
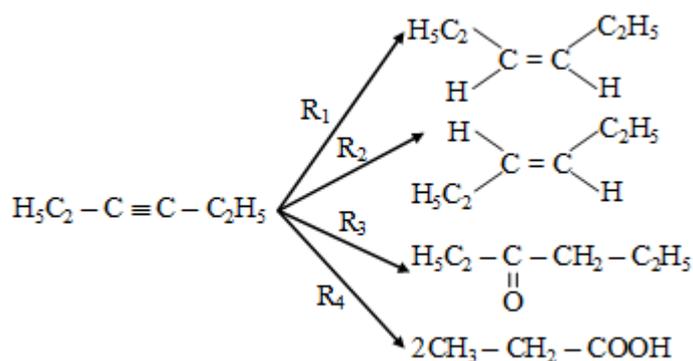
1. $\text{CH}_3 - (\text{CH}_2)_4 - \text{CH}_3$



115.

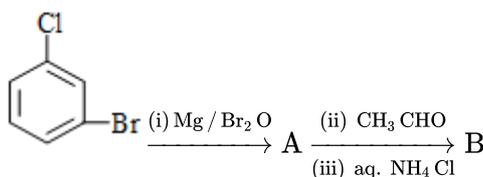
The reacting species of alc. KOH is -

1. OH^- 2. OR^+



122.

What are A & B in the following reaction

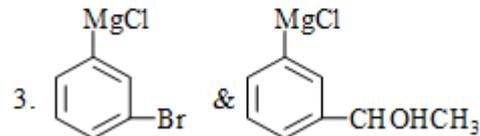
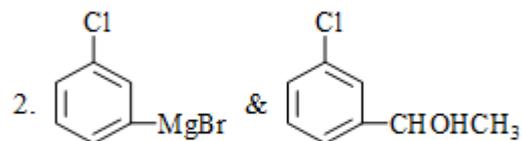
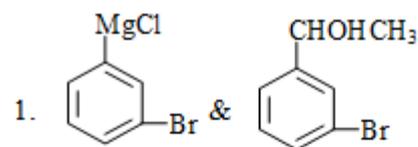
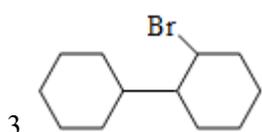
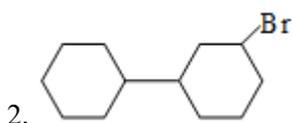
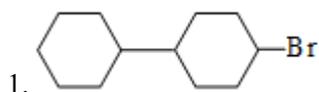
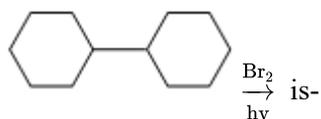


The correct set of reagents for these reactions is

- | | R ₁ | R ₂ | R ₃ | R ₄ |
|-----|--|--|--|--|
| (1) | H ₂ /Lindlar catalyst | Na/liq. NH ₃ | (i) O ₃ ,
(ii) H ₂ O | H ₂ O,
H ₂ SO ₄ ,
HgSO ₄ |
| (2) | H ₂ /Lindlar catalyst | Na/liq. NH ₃ | H ₂ O,
H ₂ SO ₄ ,
HgSO ₄ | (i) O ₃ ,
(ii) H ₂ O |
| (3) | (i) O ₃ ,
(ii) H ₂ O | H ₂ O,
H ₂ SO ₄ ,
HgSO ₄ | Na/liq. NH ₃ | H ₂ /Lindlar catalyst |
| (4) | H ₂ O,
H ₂ SO ₄ ,
HgSO ₄ | H ₂ /Lindlar catalyst | (i) O ₃ ,
(ii) H ₂ O | Na/liq. NH ₃ |

121.

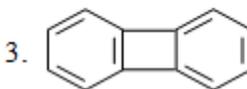
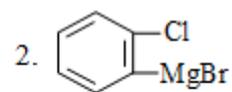
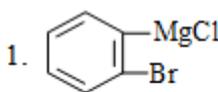
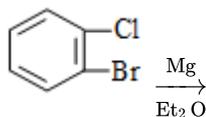
Major product for the reaction



4. None of these

123.

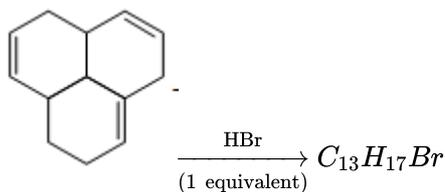
What is product of the following reaction ?

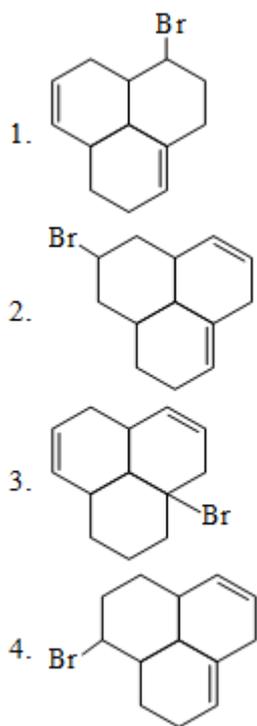


4. None of these

124.

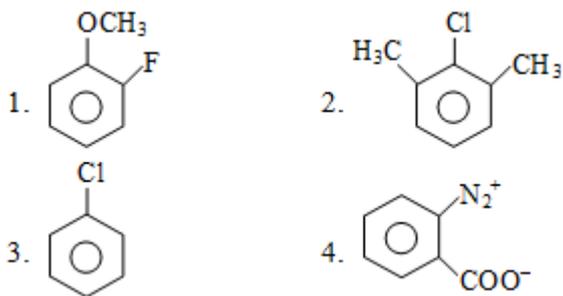
Which of the following bromides is the major product of the reaction shown below, assuming that there are no carbocation rearrangement



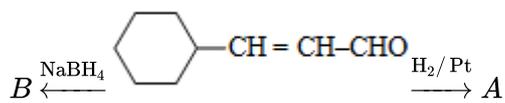


125.

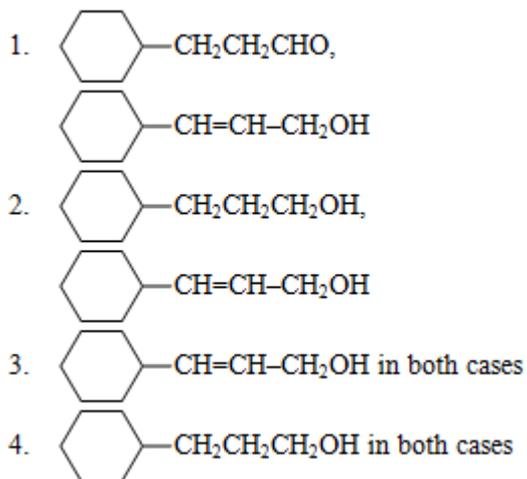
Benzyne intermediate is not observed in -



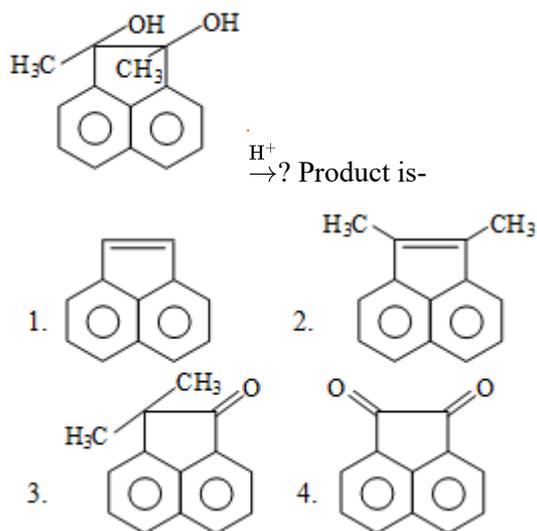
126.



A and B are-



127.

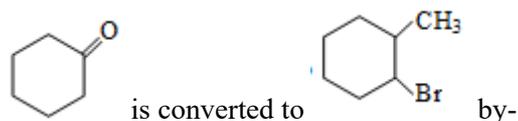


128.

The correct order of reactivity towards electrophilic substitution is -

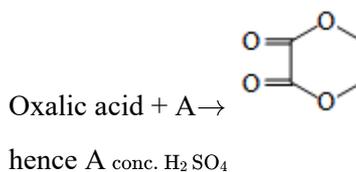
1. Phenol > Benzene > Chlorobenzene > Benzoic acid
2. Benzoic acid > Chlorobenzene > Benzene > Phenol
3. Phenol > Chlorobenzene > Benzene > Benzoic acid
4. Benzoic acid > Phenol > Benzene > Chlorobenzene

129.

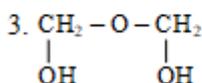
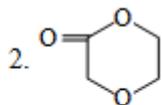
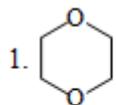


1. (i) $\text{CH}_3 - \text{MgI}$, H_3O^+ (ii) H_2SO_4 , Δ (iii) HBr , R_2O_2
2. (i) $\text{CH}_3 - \text{MgI}$, H_3O^+ (ii) H_2SO_4 , Δ (iii) HBr
3. (i) $\text{CH}_3 - \text{MgI}$, H_3O^+ (ii) HBr
4. (i) HBr , R_2O_2 (ii) $\text{CH}_3 - \text{MgI}$, H_3O^+

130.

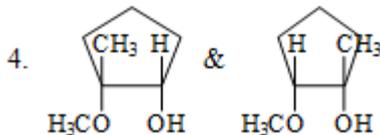
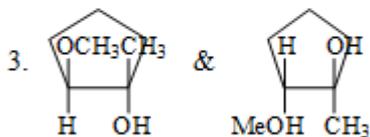
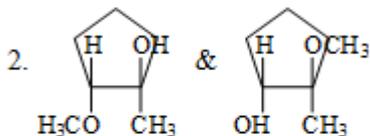
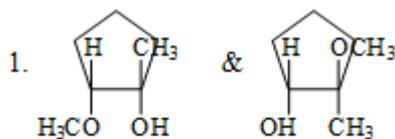
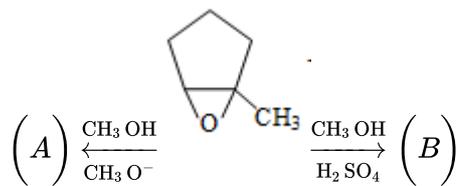


→B, B is-



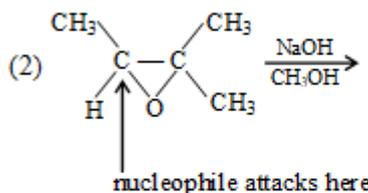
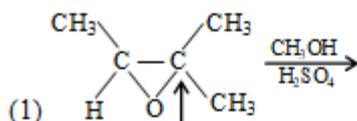
4. None of these

131.

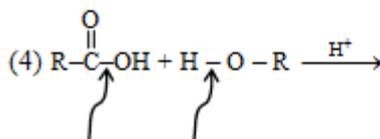
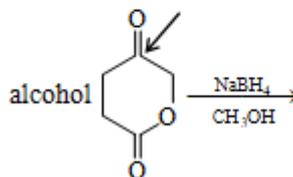


132.

Which is/are correct statements ?



(3) This is only affected in reduction to 2°



These bonds are affected in esterification

- 1 and 4
- 1 and 2
- 1, 2 and 3
- 1, 2, 3 and 4

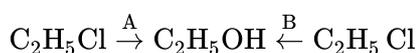
133.

Which one of the following gases is liberated when ethyl alcohol is heated with methyl magnesium iodide ?

1. Methane
2. Ethane
3. Carbondioxide
4. Propane

134.

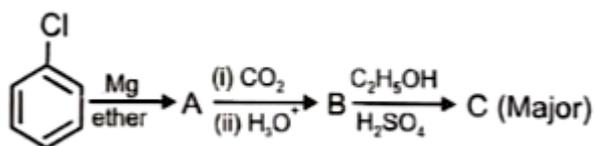
Identify A and B in the following reaction



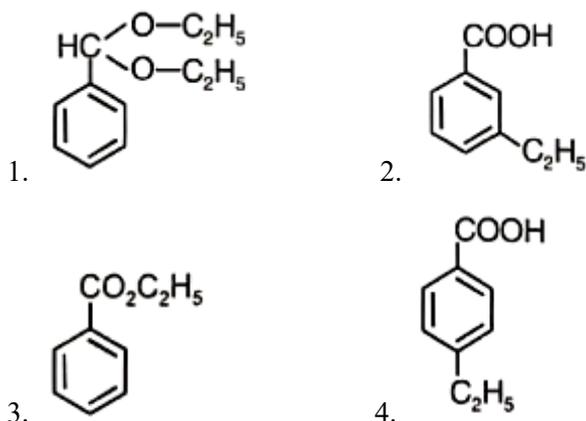
1. A = aqueous KOH; B = moist Ag_2O
2. A = alcoholic KOH ; B = aqueous NaOH
3. A = aqueous NaOH ; B = AgNO_2
4. A = AgNO_2 ; B = KNO_2

135.

Consider the following reaction sequence



Major product C is



136.

Phenomenon of polarisation justify which nature of light ?

1. longitudinal
2. transverse
3. both
4. geometrical

137.

If the wavelength of light used is halved and the numerical aperture of compound microscope is doubled, then its resolving power will

- (1) Remain unchanged
- (2) Doubled
- (3) Halved
- (4) Quadrupled

138. **n th bright fringe of red light ($\lambda_1 = 7500\text{\AA}$) coincides with $(n + 1)$ th bright fringe of green light ($\lambda = 6000\text{\AA}$). The value of $n = ?$**

- | | |
|------|------|
| 1. 4 | 2. 5 |
| 3. 3 | 4. 2 |

139.

An electromagnetic radiation has an energy of 13.2 keV. Then, the radiation belongs to the region of

- | | |
|------------------|----------------|
| 1. visible light | 2. ultraviolet |
| 3. infrared | 4. X-ray |

140.

A double slit of separation 1.5 mm is illuminated by white light (between 4500\AA - 7000\AA). On a screen 120 cm away coloured interference pattern is formed. If a pinhole is made on this screen at a distance 3.0 mm from the central white fringe, which of the following wavelength will be absent in the transmitted light?

1. 5000\AA
2. 6000\AA
3. 6500\AA
4. 7000\AA

141.

When two resistances X and Y are put in the left hand and right hand gaps in a wheatstone meter bridge, the null point is at 60cm. If X is shunted by a resistance equal to half of itself then find the shift in the null point.

1. 26.7 cm
2. 33.4 cm
3. 46.7 cm
4. 96.7 cm

142.

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 $t = 2$ sec to $t = 6$ sec will be

1. 60 coulomb
2. 24 coulomb
3. 48 coulomb
4. 30 coulomb

143.

A copper wire is stretched to make it 0.1 % longer. The percentage change in its resistance is

1. 0.2 % increase
2. 0.2% decrease

3. 0.1 % increase

4. 0.1 % decrease

144.

A battery of 10 volt is connected to a resistance of 20 ohm through a variable resistance R. The amount of charge which has passed in the circuit in 4 minutes, if the variable resistance R is increased at the rate of 5 ohm/min.

1. 120 coulomb

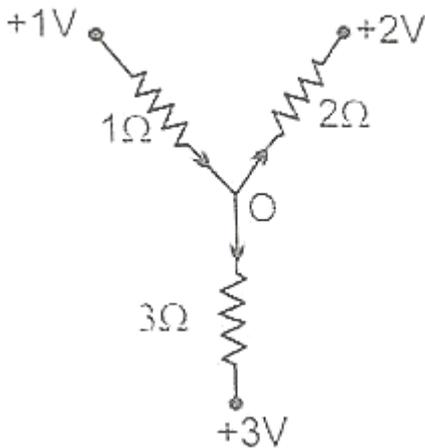
2. $120 \log_e 2$ coulomb

3. $\frac{120}{\log_e 2}$ coulomb

4. $\frac{60}{\log_e 2}$ coulomb

145.

The potential of point O in the steady state circuit shown is :



1. 11/12V

2. 18/11V

3. 16/9V

4. none of the above

146.

An electrical cable of copper has just one wire of radius 9 mm. Its resistance is 5 Ω. This single wire of cable is replaced by 6 different well-insulated copper wires each of radius 3 mm. The total resistance of the cable will now be equal to?

1. 7.5 Ω

2. 45 Ω

3. 90 Ω

4. 270 Ω

147.

A wire 250 cm long and 1 mm² in cross-section carries a current of 4 A when connected to a 2 V battery. The resistivity of the wire is

1. $0.2 \times 10^{-6} \Omega \text{ m}$

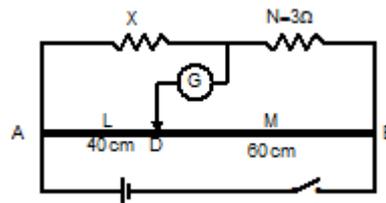
2. $2 \times 10^{-6} \Omega \text{ m}$

3. $5 \times 10^{-6} \Omega \text{ m}$

4. $4 \times 10^{-6} \Omega \text{ m}$

148.

The Wheatstone bridge shown in Fig. is balanced when the uniform slide wire AB is divided as shown. Find the value of the resistance X.



1. 3 Ω

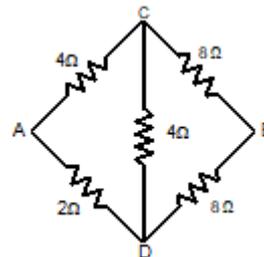
2. 4 Ω

3. 2 Ω

4. 7 Ω

149.

What is total resistance across AB in the following network ?



1. 6.4 Ω

2. 2.4 Ω

3. 7.4 Ω

4. 5.4 Ω

150.

A magnetic material of volume 30 cm³ is placed in a magnetic field of intensity 5 oersted. The magnetic moment produced due to it is 6 amp-m². The value of magnetic induction will be-

1. 0.2517 Tesla

2. 0.025 Tesla

3. 0.0025 Tesla

4. 25 Tesla.

151.

A circular disc of area $(4\hat{i} + 5\hat{j}) \times 10^{-3} \text{ m}^2$ is placed in a uniform magnetic field of intensity $(0.2\hat{i} + 0.3\hat{j})$ Tesla. The flux crossing the disc will be-

1. 23 Weber
2. 23×10^{-2} Weber
3. 23×10^{-3} Weber
4. 23×10^{-4} Weber

152.

Due to a small magnet, intensity at a distance x in the end on position is 9 Gauss. What will be the intensity at same distance in equatorial position?

1. 9 Gauss
2. 4 Gauss
3. 36 Gauss
4. 4.5 Gauss

153.

A magnet is parallel to a uniform magnetic field. If it is rotated by 60° , the work done is 0.8 J. How much work is done in moving it 30° further

1. 0.8×10^7 ergs
2. 0.4 J
3. 8 J
4. 0.8 ergs

154.

A tangent galvanometer shows a deflection 45° when 10 mA current pass through it. If the horizontal component of the earth's field is $3.6 \times 10^{-5} \text{ T}$ and radius of the coil is 10 cm. The number of turns in the coil is

1. 5700 turns
2. 57 turns
3. 570 turns
4. 5.7 turns

155.

A straight horizontal stretch of copper wire carries a current $i = 30 \text{ A}$. The linear mass density of the wire is 45 g/m. What is the magnitude of the magnetic field needed to "float" the wire, that is to be balance its weight?

1. 147 G
2. 441 G
3. 14.7 G
4. 0 G

156.

A loop of flexible conducting wire of length

0.5 m lies in a magnetic field of 1.0 T perpendicular to the plane of the loop. The tension developed in the wire if the current is of 1.57A. will be-

1. 0.15 N
2. 0.25 N
3. 0.125 N
4. 0.138 N

157.

An ammeter and a voltmeter are connected in series to a battery with an emf $E = 6 \text{ volt}$. When a certain resistance is connected in parallel with voltmeter, the reading of latter decreases two times, where as the reading of the ammeter increasing the same number of times. What is ratio of resistance of voltmeter to resistance of ammeter?

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

158.

An ac voltage is applied to a resistance R and an inductor L in series. If R and the inductive reactance are both equal to 3Ω , the phase difference between the applied voltage and the current in the circuit is :-

1. $\pi/6$
2. $\pi/4$
3. $\pi/2$
4. Zero

159.

In an ac circuit an alternating voltage $e = 200 \sqrt{2} \sin 100 t$ volts is connected to a capacitor of capacity $1\mu\text{F}$. The r.m.s. value of the current in the circuit is :-

1. 10 mA
2. 100 mA
3. 200 mA
4. 20 mA

160.

In an electrical circuit R , L , C and an a.c. voltage source are all connected in series. When L is removed from the circuit, the phase difference between the voltage and the current in the circuit is $\pi/3$. If instead, C is removed from the circuit the phase difference is again $\pi/3$. The power factor of the circuit is :

1. 1
2. $\sqrt{3}/2$
3. $\frac{1}{2}$

4. $\frac{1}{\sqrt{2}}$

161.

In an AC circuit, voltage $V = V_0 \sin \omega t$ and inductor L is connected across the circuit. Then the instantaneous power will be :-

1. $\frac{V_0^2}{2\omega L} \sin \omega t$

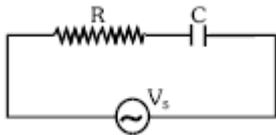
2. $\frac{-V_0^2}{2\omega L} \sin \omega t$

3. $\frac{-V_0^2}{2\omega L} \sin 2\omega t$

4. $\frac{V_0^2}{2\omega L} \sin 2\omega t$

162.

A 50 Hz a.c. source of 20 volts is connected across R and C as shown in figure below. The voltage across R is 12 volts. The voltage across C is -



1. 8 V

2. 16V

3. 10 V

4. not possible to determine unless values of R and C are given

163.

In an ideal parallel LC circuit, the capacitor is charged by connecting it to a dc source which is then disconnected. The current in the circuit :-

1. becomes zero instantaneously.

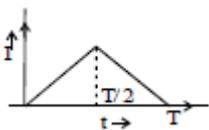
2. grows monotonically.

3. decays monotonically.

4. oscillates instantaneously.

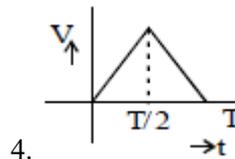
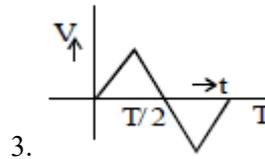
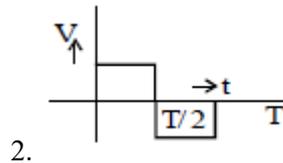
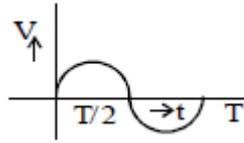
164.

The current (I) in the inductance is varying with time according to the plot shown in figure.



Which one of the following is the correct variation of voltage with time in the coil ?

1.



165.

What is the value of inductance L for which the current is a maximum in a series LCR circuit with $C=10 \mu\text{F}$ and $\omega = 1000\text{s}^{-1}$?

1. 10 mH

2. 100mH

3. 1 mH

4. cannot be calculated unless R is known

166.

Voltage across each elements of a series LCR circuit are given by $V_L = 60\text{V}$, $V_C = 20\text{V}$, $V_R = 30\text{V}$. Find out source voltage.

1. 50V

2. 100V

3. 150V

4. 200V

167.

Statement-1 :- An inductor acts as a perfect conductor for direct current.

Statement-2 :- The power factor of an inductor is zero.

1. Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.

2. Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.

3. Statement-1 is true, statement-2 is false.

4. Statement-1 is false, statement-2 is true.

168.

In a Young's double-slit experiment, the slit separation is doubled. This result in

1. an increase in fringe intensity
2. a decrease in fringe intensity
3. a halving of the fringe spacing
4. a doubling of the fringe spacing

169.

Assertion: For best contrast between maxima and minima in the interference pattern of Young's double slit experiment, the intensity of light emerging out of the two slits should be equal.

Reason: The intensity of interference pattern is proportional to square of amplitude.

170.

In Young's double slit experiment the light emitted from source has $\lambda = 6.5 \times 10^{-7}$ m and the distance between the two slits is 1 mm. Distance between the screen and slit is 1 metre. Distance between third dark and fifth birth fringe will be

1. 3.2 mm
2. 1.63 mm
3. 0.585 mm
4. 2.31 mm

171.

A bar magnet is oscillating in the Earth's magnetic field with a period T. What happens to its period and motion if its mass is quadrupled

1. Motion remains S.H. with time period = $\frac{T}{2}$
2. Motion remains S.H. with time period = 2T
3. Motion remains S.H. with time period = 4T
4. Motion remains S.H. and period remains nearly constant

172.

In an ac circuit, the instantaneous values of e.m.f. and current are $e = 200 \sin 314t$ volt and $i = \sin\left(314t + \frac{\pi}{3}\right)$ ampere. The average power consumed in watt is

1. 200

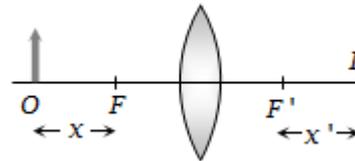
2. 100

3. 50

4. 25

173.

An object is placed at a point distant x from the focus of a convex lens and its image is formed at I as shown in the figure. The distances x, x' satisfy the relation



1. $\frac{x+x'}{2} = f$

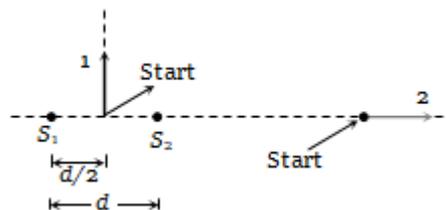
2. $f = xx'$

3. $x + x' \leq 2f$

4. $x + x' \geq 2f$

174.

Following figure shows sources S_1 and S_2 that emits light of wavelength λ in all directions. The sources are exactly in phase and are separated by a distance equal to 1.5λ . If we start at the indicated start point and travel along path 1 and 2, the interference produce a maxima all along



1. Path 1

2. Path 2

3. Any path

4. None of these

175.

In an electromagnetic wave, if at a point at an instant electric field is along y axis and magnetic field is along z axis, then the direction of propagation of the wave must be

(1) x axis

(2) -x axis

(3) -y axis

(4) Both (1) & (2) are possible

176.

A body takes 10 minutes to cool from 50°C to 40°C . If temperature of surroundings is 20°C , temperature of body in next 10 minutes is

1. 39°C
2. 30°C
3. 34°C
4. 25°C

177.

10 g of ice at 0°C is added to 10 g of water at 50°C , final temperature of mixture

1. -10°C
2. -5°C
3. 0°C
4. 10°C

178.

Two polaroids are placed such that their planes are parallel to each other with their axis of transmission at 30° to each other. If an unpolarised light of intensity I_0 is incident in first polariser then intensity of light that will be transmitted through the second polaroid is

1. $\frac{I_0}{2}$
2. $\frac{I_0}{8}$
3. $\frac{3I_0}{4}$
4. $\frac{3I_0}{8}$

179.

In young's double slit experiment slit separation is d , and distance of screen from the slit is D ($D \gg d$). If first dark fringe is formed in front of one of the slit, then wave length of light used will be

1. $\frac{3d^2}{2D}$
2. $\frac{d^2}{2D}$
3. $\frac{3D^2}{2d}$
4. $\frac{d^2}{D}$

180.

The electric and magnetic field of an electromagnetic wave are

- (1) In phase and parallel to each other and also

parallel to direction of propagation of wave

(2) In phase, parallel to each other and perpendicular to direction of propagation of wave

(3) In phase and perpendicular to each other and also perpendicular to direction of propagation of wave

(4) Out of phase, perpendicular to each other and perpendicular to direction of propagation of wave

Fill OMR Sheet

