ANKUR BATCH (SET B)
PHYSICS : DAILY CLASS TEST

Topics: Wave Optics (Interference and Polarisation), Ray Optics (Lens Prism and Spherical Mirror) Surface Tension

1. When unpolarised light beam is incident from air onto glass (n = 1.5) at the polarizing angle

    (a)   Reflected beam is polarized 100 percent

    (b)   Reflected and refracted beams are partially polarized

    (c)   The reason for (a) is that almost all the light is reflected

    (d)   All of the above

2. The optical path difference between two identical light waves arriving at a point is 31.5 λ, where λ is the wavelength of light. The point is

    (a)   Bright   (b)   Dark

    (c)   Alternative bright and dark   (d)   Neither bright nor dark

3. The displacements of two coherent light waves are given by $y_1 = a_1 \cos \omega t$ and $y_2 = a_2 \cos(\pi/2 - \omega t)$. The resultant intensity is given by

    (a) $a_1 - a_2$ (b) $a_1 + a_2$ (c) $(a_1^2 + a_2^2)$ (d) $(a_1^2 - a_2^2)$

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4. Four independent waves are expressed as

$y_1 = a_1 \sin \omega t$, $y_2 = a_2 \sin 2\omega t$

$y_3 = a_3 \cos \omega t$, $y_4 = a_4 \sin (\omega t + \pi / 3)$

A steady interference pattern can be obtained by using

(a) y_1 and y_3 (b) y_1 and y_4 (c) y_3 and y_4 (d)   not possible at all

5. What is the distance of an object from a concave mirror of focal length 20 cm so that the size of the real image is three times the size of the object?

(a)   40 cm   (b)   60 cm   (c)   26.67 cm   (d)   6.67 cm

6. You are asked to design a shaving mirror assuming that a shaving mirror assuming that a person keeps it at 10 cm from his face and views the magnified image of the face at the closest comfortable distance of 25 cm. What should be the radius of curvature of the mirror?

(a)   – 60 cm   (b)   24 cm   (c)   30 cm   (d)   24 cm

7. A ray of light passes through an equilateral prism such that the angle of incidence (i) is equal to the angle of emergence (e). The angle of emergence is equal to $\left(\dfrac{3}{4}\right)^{th}$ the angle of prism. What is the angle of deviation?

(a)   45°   (b)   39°   (c)   30°   (d)   20°

8. A ray of light passes from vacuum into a medium of refractive index n. If the angle of incidence is twice the angle of refraction, then the relation between the angle of incidence and the refractive index is

(a) $n = 2\sin\left(\dfrac{i}{2}\right)$ (b) $n = 2\cos\left(\dfrac{i}{2}\right)$ (c) $n = 2\tan\left(\dfrac{i}{2}\right)$ (d) $n = \dfrac{1}{2}\left[\cos\left(\dfrac{i}{2}\right)\right]$

9. The focal length of a convex lens is 30 cm and the size of the image is quarter of the object. What is the distance of the object from the lens?

(a)   90 cm   (b)   60 cm   (c)   30 cm   (d)   50 cm

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10. How far from a convex lens of focal length 20 cm would you place an object to get a virtual image, which is magnified 3 times?

    (a)   7.5 cm   (b)   10.8 cm   (c)   13.33 cm   (d)   16.5 cm

11. Two small drops of mercury each of radius R coalesce to form a single drop. The ratio of the total surface energies before and after the change is

    (a) $1 : 2$ (b) $2 : 1$ (c) $1 : 2^{1/3}$ (d) $2^{1/3} : 1$

12. A water drop of radius R is split into n smaller drops, each of radius r. If T is the surface tension of water, then the work done in this process is

    (a) $\frac{4}{3}\pi R^3 T\left(\frac{1}{r} - \frac{1}{R}\right)$ (b) $\frac{3}{4}\pi R^3 T\left(\frac{1}{R} - \frac{1}{r}\right)$ (c) $4\pi R^3 T\left(\frac{1}{r} - \frac{1}{R}\right)$ (d) $6\pi R^{-2} T\left(\frac{1}{R} - \frac{1}{r}\right)$

13. A capillary tube when immersed vertically in a liquid records a rise of 3 cm. If the tube is immersed in the liquid at an angle of 60° with the vertical, then the length of the liquid column along the tube will be

    (a)   3 cm   (b)   4 cm   (c)   5 cm   (d)   6 cm

14. Through which character we can distinguish the light waves from sound waves

    (a)   Interference   (b)   Refraction   (c)   Polarisation   (d)   Reflection

15. The angle of incidence at which reflected light is totally polarized for reflection from air to glass (refractive index n) is

    (a) $\sin^{-1}(n)$ (b) $\sin^{-1}\left(\frac{1}{n}\right)$ (c) $\tan^{-1}\left(\frac{1}{n}\right)$ (d) $\tan^{-1}(n)$
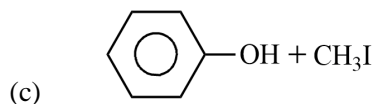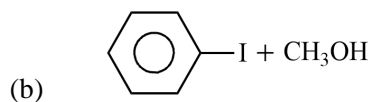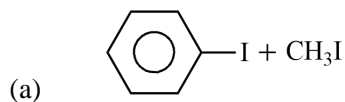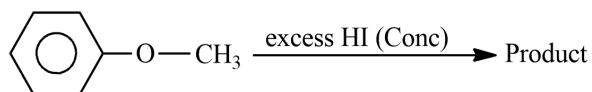
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ANKUR BATCH
CHEMISTRY : DCT SET - B
Topic: Full Organic

16.   Which one of the following is temporary effect

      (a)   Inductive   (b)   Mesomeric   (c)   Electromeric   (d)   All

17.   Which of the following drugs is an analgesic?

      (a)   Sulphaguanidine   (b)   Paludrin   (c)   Analgin   (d)   Iodex

18.   Sugars are

      (a)   Optically active polyhydroxy aldehydes

      (b)   Optically active polyhydroxy ketones

      (c)   Optically active polyhydroxy aldehydes or ketones

      (d)   Polyhydroxy aldehydes or ketones which may or may not be optically active

19.   Formation of benzene from acetylene is

      (a)   Trimerisation   (b)   Tetramerisation (c)   Dimerisation   (d)   Condensation

20.   Which of the following converts Benzene diazonium chloride to Benzene?

      (a) H_3PO_3 (b) C_2H_5OH (c) H_2O (d) HBF_4

21.   Tischancko reaction is used for preparation of

      (a)   Ether   (b)   Ester   (c)   Amide   (d)   Acid anhydride

22.   The type of isomerism exhibited by compounds, $CH_3CH_2OCH_2CH_3$ and $CH_3OC_3H_7$ is referred as

      (a)   Metamerism   (b)   Chain Isomerism

      (c)   Functional isomerism   (d)   Position isomerism

23.   Pepsin enzyme hydrolyses

      (a)   Proteins to amino acids   (b)   Fats to fatty acids

      (c)   Glucose to ethyl alcohol   (d)   Polysaccharides to monosaccharides

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24. The following reaction is given below

$O—CH_3$ $\xrightarrow{\text{excess HI (Conc)}}$ Product

(a) $—I + CH_3I$

(b) $—I + CH_3OH$

(c) $—OH + CH_3I$

(d) $—OH + CH_3OH$
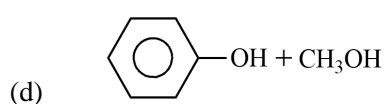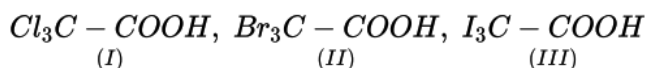
25. Treatment of ammonia with excess of ethyl chloride will yield

(a) diethyl amine

(b) methyl amine

(c) tetraethyl ammonium chloride

(d) ethane

26. Consider the following compounds.

$$Cl_3C - COOH, \quad Br_3C - COOH, \quad I_3C - COOH$$
$$\quad (I) \qquad\qquad\qquad (II) \qquad\qquad\qquad (III)$$

The decreasing order of decarboxylation is

(a) I > II > III
(b) III > II > II
(c) III > I > II
(d) II > I > III

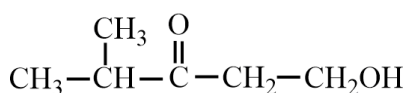26. 1-butyne on oxidation with hot alkaline KMnO4 would yield which of the following as end product?

(a) $CH_3CH_2CH_2COOH$

(b) CH_3CH_2COOH

(c) $CH_3CH_2COOH + CO_2 + H_2O$

(d) $CH_3CH_2COOH + HCOOH$

28. The IUPAC name of the following structure is :

$$CH_3—\underset{\underset{CH_3}{|}}{CH}—\underset{\underset{O}{\|}}{C}—CH_2—CH_2OH$$

(a) 1-hydroxy 4-methyl 3-pentanone

(b) 2-methyl 5-hydroxy 3-pentanone
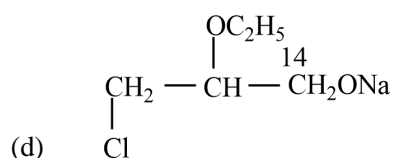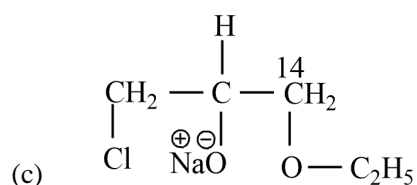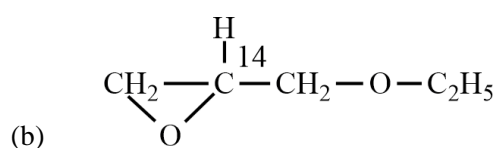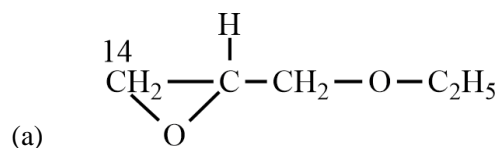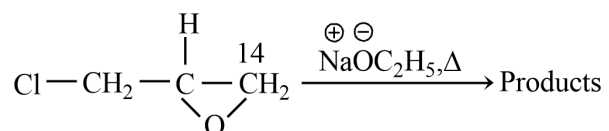
(c) 4-methyl 3-oxo 1-pentanol

(d) Hexanol-1, one-3

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29. The IPUAC name of $CH_3CHOHCH_2 - O - CH_2CH_3$ is

   (a)   1-ethoxy propan-2-ol

   (b)   3-ethoxy propan-2-ol

   (c)   1-ethoxy-2- hydroxy propane

   (d)   None of these

30. The major product of the following reaction is

(a)

(b)

(c)

(d)

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Max. Marks: 60   **Date: 15.10.2022**

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PHYSICS : DCT SET - B ANSWER KEY
Topics: Wave Optics (Interference and Polarisation),
Ray Optics (Lens Prism and Spherical Mirror) Surface Tension

1.	(a)	2.	(b)	3.	(c)	4.	(d)	5.	(c)
6.	(a)	7.	(c)	8.	(b)	9.	(a)	10.	(c)
11.	(d)	12.	(c)	13.	(d)	14.	(c)	15.	(d)

Max Marks: 60   **Date: 15.10.2022**

ANKUR BATCH
CHEMISTRY : DCT SET - B ANSWER KEY
Topic: Full Organic

16.	(c)	17.	(c)	18.	(d)	19.	(a)	20.	(b)
21.	(b)	22.	(a)	23.	(a)	24.	(c)	25.	(c)
26.	(a)	27.	(c)	28.	(a)	29.	(a)	30.	(a)