JIPMER MBBS ENTRANCE TEST 2018

EXAMINATION PAPER

(BASED ON MEMORY RETENTION)

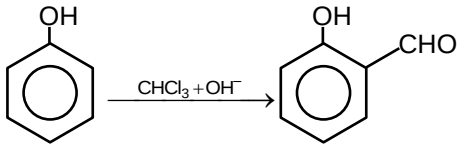
Date : 03-06-2018 (Sunday) | Time : 10.00 am - 12.30 pm | Morning Session

NOTE:-

1. Questions are collected from the appeared students.
2. The solutions are prepared by the expert faculty team of Resonance Pre-Medical division, Kota.
3. Questions may not be in the order or sequence as asked in the actual examination paper.
4. The questions collected may not have all the options similar to the actual paper. Students are advised to see the question and answer / solutions.
5. Actual JIPMER Paper has 200 questions but we have included only those many questions which have been collected from the students as per following table :-

Subject	No. of Question in Actual JIPMER Paper	No. of Question in this Paper
Chemistry	60	39
Physics	60	45
Biology	60	55
English & Comprehension + Logical & Quantitative Reasoning	20	07
Total	**200**	**146**

PART - A (CHEMISTRY)

1. 

Intermediate of above reaction is :

(1) $:CCl_2$ (2) : CHCl (3) $\overset{+}{C}HCl_2$ (4) $\overset{+}{C}Cl_3$

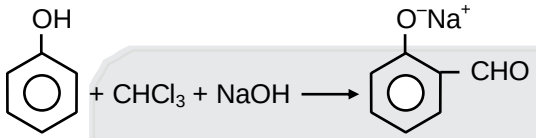
Ans. **(1)**

Sol. This is a Reimer-Tieman reaction

This is a electrophilic substitution reaction of phenol

यह एक राइमर टिमान अभिक्रिया है

यह फिनॉल की इलेक्ट्रॉनस्नेही प्रतिस्थापन अभिक्रिया है



I : $CHCl_3 + NaOH \longrightarrow \overset{\ominus}{C}Cl_3 + H_2O$

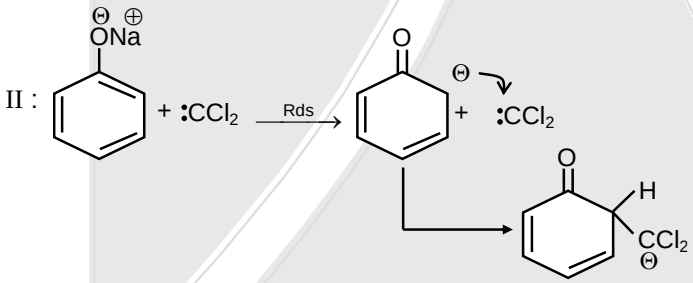
$\overset{\ominus}{C}Cl_3 \xrightarrow{-Cl^-} :CCl_2$

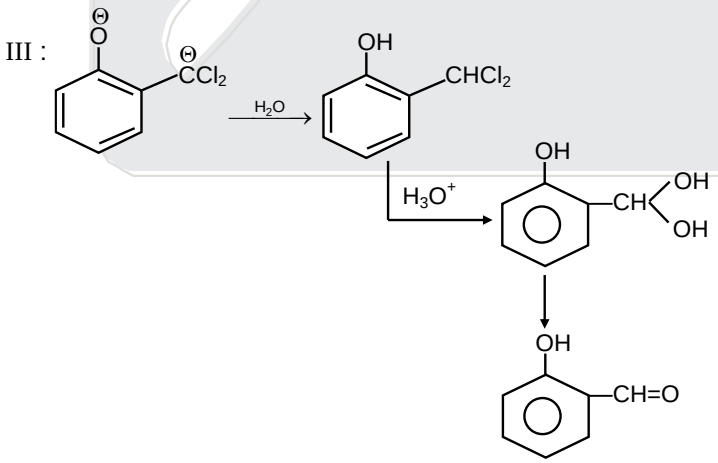
→ dichloro carbene (डाईक्लोरोकार्बीन)

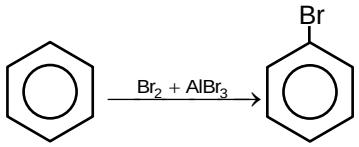
→ Incomplete octate (अपूर्ण अष्टक)

→ $6e^-$

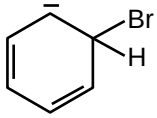
→ act as a electrophile (इलेक्ट्रॉनस्नेही की तरह व्यवहार)

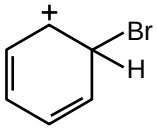
II : 

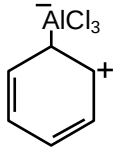
III : 

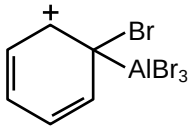
2. 

Which is intermediate of above reaction :

(1) 

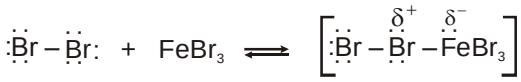
(2) 

(3) 

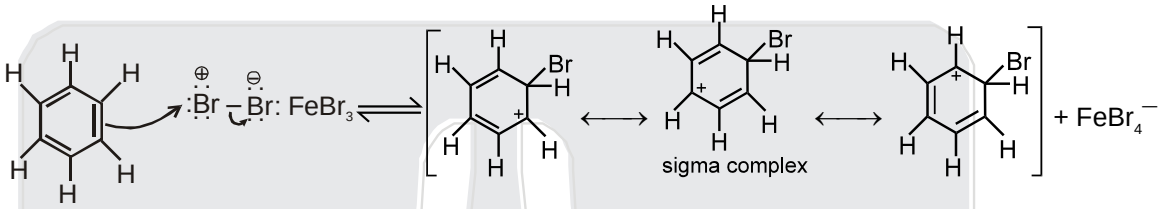
(4) 

Ans. **(2)**

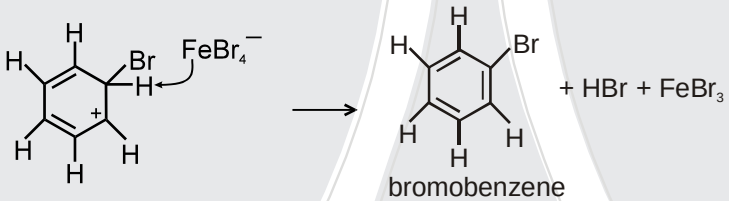
Sol. **Step 1 :** Formation of a stronger electrophile.



Step 2 : Electrophilic attack and formation of the sigma complex.



Step 3 : Loss of a proton gives the products.

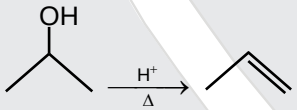


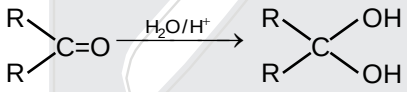
Other halogenating agents are ICl, HOCl etc.

order of effectiveness – $Cl_2 > BrCl > Br_2 > ICl > I_2$

3. Which of the following is substitution reaction -

(1) 

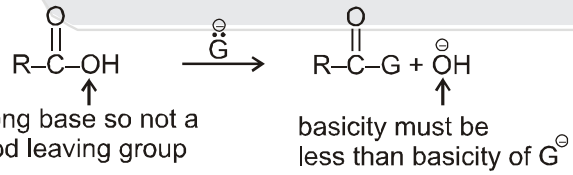
(2) 

(3) 

(4) R–MgBr + $CH_3COOH \longrightarrow$ R–H

Ans. **(1)**

Sol. **Reaction involving replacement of –OH group :**



This is nucleophilic substitution reactions.

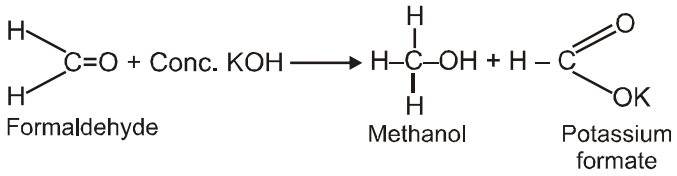
4. Which is the following undergoes self oxidation and self reduction in same reaction

(1) C_7H_8O (2) CH_2O (3) C_3H_7O (4) C_2H_4O

Ans. **(2)**

Sol. **Cannizzaro reaction :**

Aldehydes which do not have an α-hydrogen atom, undergo self oxidation and reduction (disproportionation) reaction on treatment with a concentrated alkali.



5. Which of the following reaction produces ethylacetoacetate -

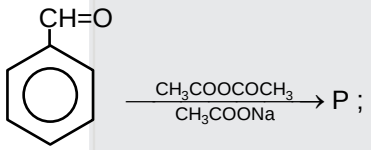
(1) Cannizaro reaaction (2) Claisen reaction

(3) Reformatsky reaction (4) Aldol reaction

Ans. **(2)**

Sol. $CH_3–\overset{O}{\overset{\|}{C}}–CH_2–\overset{O}{\overset{\|}{C}}–O–C_2H_5$ (ethyl aceto acetate)

This is a β-keto ester which is form by clasinen ester condensation.

6. 

Major product of above reaction :

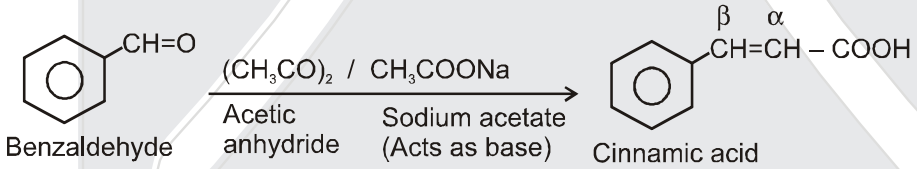
(1) $C_6H_5–CH=CH–COOH$ (2) $C_6H_5–COOH$

(3) $C_6H_5–CH=CH–COOCH_3$ (4) $C_6H_5–CH_2–CHO$

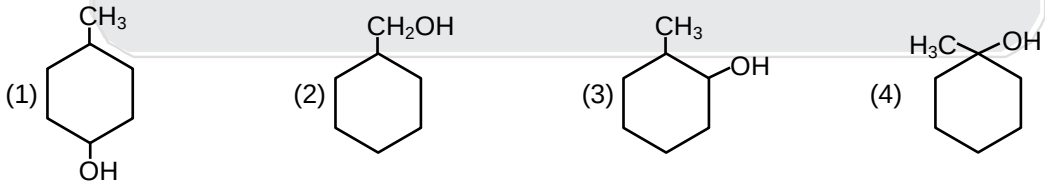
Ans.

Sol. **Perkin reaction :**

When aromatic aldehyde like benzaldehyde is treated with anhydride in the presence of sodium salt of acid from which anhydride is derived we get α, β-unsaturated acid.



7. Which of the following alcohol will react fastest with HCl



Ans. **(4)**

8. Which is correct for cellulose –

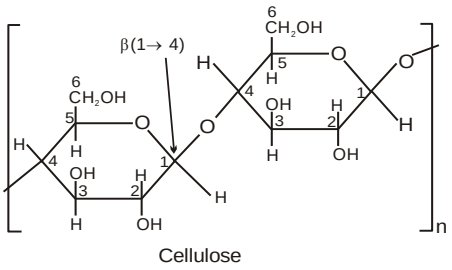
(1) branched, $\alpha(1,4)$ – glucose (2) Unbranched, $\alpha(1,6)$ – glucose

(3) Unbranched, $\beta(1,4)$ – glucose (4) branched, $\alpha(1,4)$ band β (1, 6)

Ans. **(3)**

Sol.

Cellulose



Cellulose

Unbranched, $\beta(1,4)$ – glucose

9. Which of the following is correct for Lactose

(1) It is nonreducing sugar

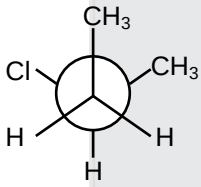
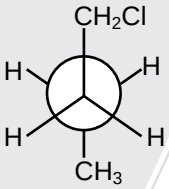
(2) Glycosidic bond [1,4] between glucose and galactose

(3) Glycosidic bond [1,4] between glucose and fructose

(4) Glycosidic bond [1,2] between glucose and galactose

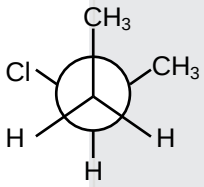
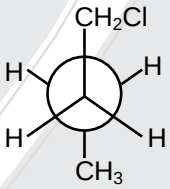
Ans. **(2)**

Sol. Lactose = Glycosidic bond [1,4] between glucose and galactose

10.  and  are :-

(1) Enantiomers (2) Conformers (3) Positional isomers (4) None of these

Ans. **(3)**

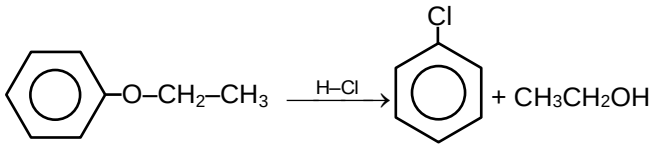
Sol.  

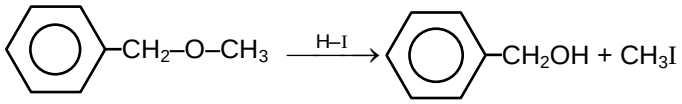
$CH_3 - CH_2 - \underset{\displaystyle Cl}{\underset{|}{CH}} - CH_3$ $CH_2 - CH_2 - CH_2 - CH_3$ with Cl

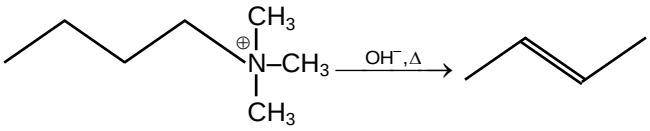
2–Chlorobutane 1–Chlorobutane

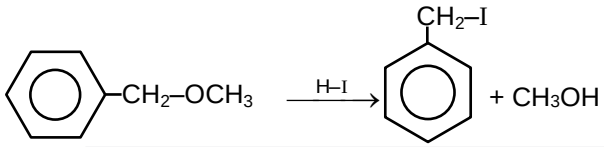
Position Isomer to each each other

11. Which of the following is correct

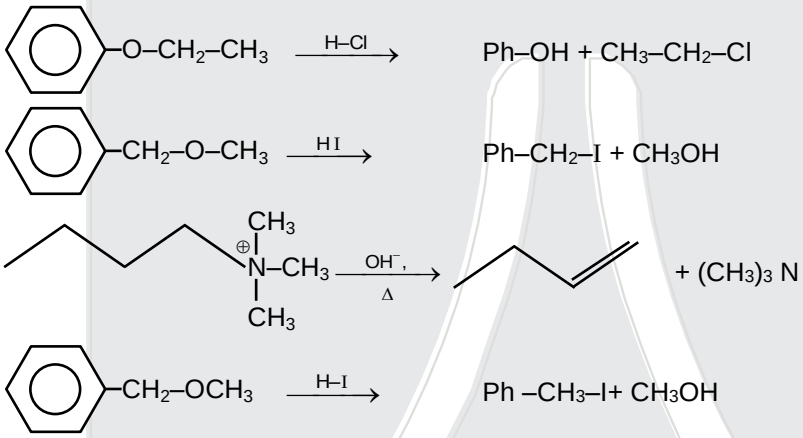
(1) 

(2) 

(3) 

(4) 

Ans. **(4)**

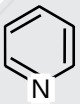
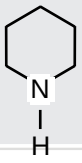
Sol. 

12. Which of the following is not aromatic heterocyclic -

(1) Pyrol (2) furon (3) pyridine (4) piperidine

Ans. **(4)**

Sol. Pyrrole  Furan 

Pyridine  Piperidine 

13. Which of the following is not a nucleophile :

(1) CH_3O^- (2) H_2O (3) $CH_3–OCH_3$ (4) 

Ans. **(4)**

Sol. Nucleophile are electron rich species, can donate their electron SO,  is not a Nucleophile.

14. What is Tg for polymer

(1) Melting point (2) Boiling point

(3) Glass transition temperature (4) None of these

Ans. **(3)**

15. In the given reaction

XeF_6 + …… ⟶ XeO_3 + 6HF

Complete the reaction

(1) 24 H_2O (2) 3H_2O (3) 6H_2O (4) 12H_2O

Ans. **(2)**

Sol. $XeF_6 + 3H_2O \longrightarrow XeO_3 + 6HF$

16. Which of the following is organometalic compound

(1) Methyl lithium (2) Lithium methoxide (3) Lithium dimethyl amide (4) Lithium acetate

Ans. **(1)**

Sol. $LiCH_3$ have metal carbon bond so considered organometic compound and other do not have.

17. Increasing order of oxidation state of metal in

$KMnO_4$, $MnCl_2$, MnO_2, $Mn(OH)_3$ is :

(1) $Mn(OH)_3 < MnCl_2 < MnO_2 < KMnO_4$ (2) $KMnO_4 < Mn(OH)_3 < MnO_2 < MnCl_2$

(3) $MnCl_2 < Mn(OH)_3 < KMnO_4 < MnO_2$ (4) $MnCl_2 < Mn(OH)_3 < MnO_2 < KMnO_4$

Ans. **(4)**

Sol. $KMnO_4$ O.N of Mn = + 7

$MnCl_2$ O.N. of Mn = +2

MnO_2 O.N. of Mn = +4

$Mn(OH)_3$ O.N. of Mn = +3

18. Smallest bond angle in the following is

NCl_3, PCl_3, $SbCl_3$, $AsCl_3$

(1) NCl_3 (2) PCl_3 (3) $SbCl_3$ (4) $AsCl_3$

Ans. **(3)**

Sol. Bond angle α EN of central atom

$NCl_3 > PCl_3 > AsCl_3 > SbCl_3$

19. In the reaction NaOH (hot and conc.) + Cl_2 ⟶ NaCl + $NaClO_3$

Change in oxidation state of Cl_2 is :

(1) 0 to –1 and +5 (2) 0 to –1 and +3 (3) 0 to 0 and –1 (4) 0 to –1 and +7

Ans. **(1)**

Sol. $OH^- + Cl_2 \longrightarrow Cl^- + ClO_3^-$

0 –1 +5

20. Which of the following is not sp^3 hybridise

(1) BH_3 (2) BH_4^- (3) NH_4^+ (4) NH_3

Ans. **(1)**

Sol. $BH_3 \longrightarrow Sp^2$ $NH_4^+ \longrightarrow Sp^3$

$BH_4^- \longrightarrow Sp^3$ $NH_3 \longrightarrow Sp^3$

21. Which of the following is paramagnetic

(1) Rhombic S_8 (2) Rhombic S_6 (3) Vapour S_2 (4) None of these

Ans. **(3)**

Sol. S_2 vapour is paramagnetic like O_2 according to MOT it contain 2 unpaired electron in π3p orbital

22. Which of the following reaction is incorrect ?

(1) $KBr_3 + I_2 \longrightarrow KI_3 + Br_2$ (2) $KCl_3 + F_2 \longrightarrow KF_3 + Cl_2$

(3) $KBr_3 + Cl_2 \longrightarrow KCl_3 + Br_2$ (4) $Li_2O + KCl \longrightarrow K_2O + LiCl$

Ans. **(2)**

Sol. Can not form F_3^- as it does not have vacant d orbital.

23. In CaF_2 lattice coordination number of Ca^{+2} & F^- is :

(1) 4, 4 (2) 8, 8 (3) 4, 8 (4) 8, 4

Ans. **(4)**

Sol. Ca^{+2} occupy at FCC lattice site and F^- occupy at tetrahedral void so C.N. of Ca^{+2} = 8 and F^- C.N. = 4

24. Correct order of polarizing power is

(1) $Be^{+2} > Mg^{+2} > Ca^{+2} > K^+$ (2) $Be^{+2} > Ca^{+2} > Mg^{+2} > K^+$

(3) $Mg^{+2} > Ca^{+2} > Be^{+2} > K^+$ (4) $Mg^{+2} > Be^{+2} > Ca^{+2} > K^+$

Ans. **(1)**

Sol. Polarising power α charge of cation

$$\alpha \quad \frac{1}{\text{size of cation}}$$

$Be^{+2} > Mg^{+2} > Ca^{+2} > K^+$

25. Most reactive nobel gas is :

(1) Ar (2) Xe (3) He (4) Ne

Ans. **(2)**

Sol. As size increases, I.E. decreases reactivity of noble gas increases so Xe is most reactive.

26. Cassetrite is Ore of :

(1) Sn (2) Mg (3) Pb (4) Hg

Ans. **(2)**

Sol. Cassetrite is SnO_2 ore

27. If Molar conductivity of Ca^{2+} = 119 & Molar conductivity of Cl^- = 71 then find the molar conductivity of $CaCl_2$:

(1) 341 (2) 261 (3) 126 (4) 431

Ans. **(2)**

Sol. $V_m (CaCl_2) = \wedge_{Ca^{+2}} + 2\wedge_{Cl^-}$

$= 119 + 71 \times 2$

$= 261$

28. If 22 gm benzene Present in 100 gm CCl_4 then find the % W/W of benzene in solution:

(1) 15 % (2) 20 % (3) 12 % (4) 18 %

Ans. **(4)**

Sol. $\%w/w = \frac{\text{mass benzene}}{\text{Total mass}} \times 100 = \frac{22}{22+100} = \frac{22}{122} \times 100 = 18\%$

29. Which have Vont Hoff factor same as $K_4[Fe(CN)_6]$

(1) $Al_2(SO_4)_3$ (2) $Mg(NO_3)_2$ (3) $CaCl_2$ (4) $NaNO_3$

Ans. **(1)**

Sol. i for $K_4[Fe(CN)_6]$ is 5 and equal to i of $Al_2(SO_4)_3$

30. Favorable condition for product formation in the given reaction. $SO_2 + ½O_2 \rightleftharpoons SO_3(g)$

(1) High pressure (2) High temperature & low pressure

(3) Low temperature & high pressure (4) Low temperature & low pressure

Ans. **(1)**

Sol. $SO_2 + \frac{1}{2}O_2 \rightleftharpoons SO_3$

At high pressure, forward shift

So SO_3 mole are increased.

31. The time required to complete ¾th of first order reaction is 32 min. then find $t_{\frac{1}{2}}$ = ?

(1) 16 (2) 160 (3) 1600 (4) 32

Ans. **(1)**

Sol. $t_{\frac{3}{4}} = 2t_{\frac{1}{2}}$ = 32 min. $t_{\frac{1}{2}}$ = 16 min

32. Which is amphoteric :

(1) Al_2O_3 (2) CrO_3 (3) BeO (4) CO_2

Ans. **(1)**

Sol. Al_2O_3 react with acid and base so it show how amphoteric nature.

33. Find the concentration of glucose in blood which have osmotic pressure π = 7.7 atm at T = 25ºC

(1) 0.31 M (2) 0.45 M (3) 0.56 M (4) 0.89 M

Ans. **(1)**

Sol. $\pi = CRT$

$7.7 = C \times 0.082 \times 298$

$C = \frac{7.7}{24.44} \times 100 = 0.31$

34. A atom form F.C.C. lattice with density d = 8.92 gm/ml and edge length a = 3.6×10^{-8} cm then find the molecular mass of atom in a.m.u. ?

(1) 62 a.m.u. (2) 93 a.m.u. (3) 98 a.m.u. (4) 32 a.m.u.

Ans. **(1)**

Sol. $d = \frac{zA}{N_A a^3}$

$$8.92 = \frac{4 \times A}{6 \times 10^{23} \times \left(3.6 \times 10^{8}\right)^3}$$

$$A = \frac{8.92 \times 6 \times (3.6)^3}{40} = 62$$

35. Formula of plaster of paris :

(1) $CaSO_4\ ½H_2O$ (2) $CaSO_4\ 2H_2O$ (3) $CaSO_4\ 1H_2O$ (4) $CaSO_4\ 4H_2O$

Ans. **(1)**

Sol. $CaSO_4.\ \frac{1}{2}H_2O$

Hemihydrate calcium sulphate is called plaster of paris (POP)

36. Oxide ion form H.C.P. lattice & Al^{3+} Occupies $\frac{2}{3}$ of octahedral void then find the formula of compound:

(1) Al_2O_3 (2) AlO_2 (3) Al_3O_2 (4) AlO

Ans. **(1)**

Sol. $O^{2-} \longrightarrow$ HCP lattice

$\longrightarrow$ 6 ion

$Al^{+3} \longrightarrow \frac{2}{3} \times O.V$

$= \frac{2}{3} \times 6 = 4$

$Al_4O_6 = Al_2O_3$

37. Heating vitamin B_2 then colour will be :

(1) Yellow (2) Red (3) Violet (4) Black

Ans. **(3)**

38. Which of the following have maximum lattice energy :

(1) LiF (2) CsCl (3) KBr (4) NaCl

Ans. **(1)**

Sol. L.E α $|Z^+|\,|Z^-|$

$\alpha \frac{1}{\text{Size}}$ of ion

So LiF should have
Highest L.E

39. Which of the following is the component of CsI_3 lattice :

(1) Cs^+, I^-, & I_2 molecule (2) Covalent bond

(3) Cs^+, & I^- ions (4) Cs^+ & I_2

Ans. **(1)**

Sol. $CsI_3 \longrightarrow Cs^+ + I^- + I_2$ vapowr

PART - B (PHYSICS)

40. Dimension of force is
(1) $M^1L^{-1}T^{-2}$ (2) $M^1L^1T^{-2}$ (3) $M^2L^{-1}T^{-2}$ (4) $M^1L^{-1}T^{-1}$
Ans. (2)

41. Which is wrong dimension
(1) $v = u + at$ (2) $s = vt^2$ (3) $s = \frac{1}{2}at^2$ (4) $E = mc^2$
Ans. (2)

42. A vernier least count 0.1 mm percentage error in volume of cube of side 30 mm.
(1) 03% (2) 1% (3) 3% (4) 0%
Ans. (2)

43. If current in inductor of 5 mH varying as $I = t^2 . e^{-2t}$ then find time after which voltage drop across inductor become zero.
(1) t = 1sec (2) t = 3 sec (3) t = 2 sec (4) t = 4 sec
Ans. (1)

44. In YDSE S_1 and S_2 has intensity I and 9I. Find difference in intensity b/w point which has phase difference of $\pi/2$ and π.
(1) 10 I (2) 6 I (3) 8 I (4) 4 I
Ans. (3)

45. In YDSE if white light is used then.
(1) except center, there will be spectrum (2) except center no spectrum any where
(3) spectrum every where (4) spectrum at center only
Ans. (1)

46. If 2 bubble of radius r_1 & r_2 are combined then find radius of common surface.
(1) $\frac{r_1r_2}{r_1+r_2}$ (2) $\frac{r_1r_2}{r_2-r_1}$ (3) $\sqrt{r_1r_2}$ (4) $\frac{r_1+r_2}{2}$
Ans. (2)

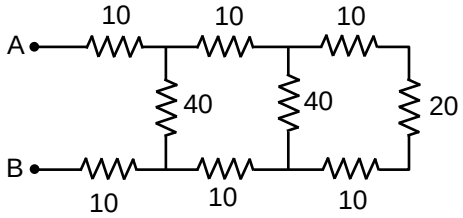
47. If point charges $Q_1 = 2\times10^{-7}$ C and $Q_2 = 3 \times 10^{-7}$ C are at. 30 cm separation. Find electrostatic force them
(1) 6×10^{-3} N (2) 2×10^{-3} N (3) 3×10^{-3} N (4) 8×10^{-3} N
Ans. (1)

48. If in isothermal process Δw work is done by gas, then choose incorrect
(1) $\Delta U = 0$ (2) $\Delta S \neq 0$ (3) $\Delta T = 0$ (4) $\Delta P = 0$
Ans. (4)

49. If a machine perform 4000 J output work and 1000 J is inside loss due to friction find efficiency = ?
(1) 20% (2) 25% (3) 80% (4) 60%
Ans. (3)

50. For uranium nucleus. Find relation between mass and volume
(1) $m \propto v$ (2) $m \propto \sqrt{v}$ (3) $m \propto v^2$ (4) $m \propto \frac{1}{v}$
Ans. (1)

51. Find R_{net} between A and B



(1) 40 (2) 60 (3) 70 (4) 20

Ans. **(1)**

52. A particle is thrown vertically up with speed 6m/s find maximum height achieved

(1) 0.9 meter (2) 3.6 meter (3) 1.8 meter (4) 1 meter

Ans. **(3)**

Sol. $H = \frac{6^2}{25} = \frac{36}{20} = 1.8$

53. A missile is fired at 30º angle from horizontal with 90 m/s find time of flight

(1) 9 (2) 20 (3) 40 (4) 15

Ans. **(1)**

Sol. $T = \frac{2 \times 90 \times \frac{1}{2}}{10} = 9$

54. Two identical capillary tube are tilted in liquid with 45º and 60º from vertical find ratio of length of fluid in capillary

(1) $1 : 2\sqrt{2}$ (2) 1 : 2 (3) $2\sqrt{2} : 1$ (4) $1 : \sqrt{2}$

Ans. **(4)**

55. A real object is on principle axis of concave mirror of focal length 2m object distance from pole is 8m. Find image distance.

(1) 2.66 m (2) 1.66 m (3) ∞ (4) 2 m

Ans. **(1)**

56. Velocity is given by v = 4t(1 – 2t) then find time at which velocity is maximum.

(1) 0.5 sec (2) 0.25 sec (3) 0.45 sec (4) 1 sec

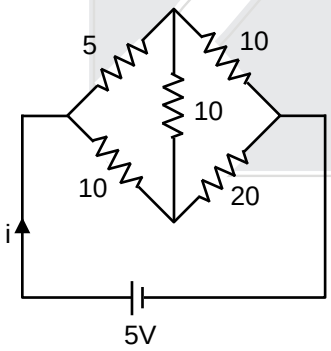
Ans. **(2)**

57. Find pressure on swimmer at a depth of 10 m in water

(1) 2 atm (2) 1 atm (3) 3 atm (4) 4 atm

Ans. **(1)**

58. Find i = ?



(1) 0.5 Amp (2) 0.2 Amp (3) 2 Amp (4) 0.25 Amp

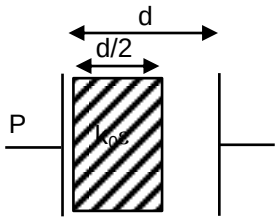
Ans. **(1)**

59. If compressibility of material is 4×10^{-5} per atm, pressure is 100 atm and volume 100 cm^3 find a ΔV = ?

(1) 0.2 cm^3 (2) 0.8 cm^3 (3) 0.4 cm^3 (4) 0.6 cm^3

Ans. **(3)**

60. Find a capacitance



(1) $\frac{2kA\varepsilon_0}{d}$ (2) $\frac{2kA\varepsilon_0}{(k+1)d}$ (3) $\frac{(k+1)A\varepsilon_0}{2d}$ (4) $\frac{2kA\varepsilon_0}{(k^2+1)d}$

Ans. **(2)**

61. Two parallel wire carries current I_1 and I_2 are separated by distance d. Force per unit length of wire is F. Then :

(1) $F \propto d$ (2) $F \propto \frac{1}{d}$ (3) $F \propto d^2$ (4) $F \propto \frac{1}{d^2}$

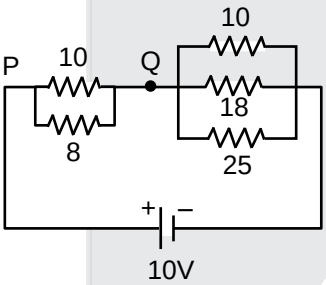
Ans. **(2)**

62. Two concentric circular coil of radius 20 cm and 30 cm carries current 2A and 3A respectively in opposite direction then magnetic field at centre will be :-

(1) $4\pi \times 10^{-7}$ (2) $2\pi \times 10^{-7}$ (3) 2×10^{-7} (4) zero

Ans. **(4)**

63. $V_p - V_Q$ = ?



(1) 6.68 volt (2) 4.65 volt (3) 8.72 volt (4) 7.11 volt

Ans. **(2)**

64. A capacitor has capacitance 2F. plate separation 0.5 cm then area of plate

(1) 1130 cm^2 (2) 1130 m^2 (3) 1130 km^2 (4) None of these

Ans. **(4)**

Sol. $C = \frac{\varepsilon_0 A}{d}$

$A = \frac{Cd}{\varepsilon_0} \qquad \frac{(2)(0.5\times10^{-2})}{5.85\times10^{-12}}$

$A = 1.130 \times 10^9\ m^2$

65. Pressure in non uniform cross section wire will be least at

(1) where tube diameter is less (2) where speed is less

(3) where speed is more (4) pressure is some at each cross section

Ans. **(2)**

66. For a permanent magnet, properties of material should be

(1) high retentivity high coercivity (2) low retentivity law coercivity

(3) high retentivity low coercivity (4) low retentivity high coercivity

Ans. **(1)**

67. A particle performing SHM for maximum speed 50 m/s so and maximum acceleration = 100 m/s^2 then time period of SHM ?

(1) 1 sec (2) 2π sec (3) π sec (4) 2 sec

Ans. **(3)**

Sol. $T = \frac{2\pi}{\omega} = p$

68. Two particle are moving in opposite direction with speed v_1 and v_2 . What may be their velocity if relative velocity is 6 m/sec

(1) 4.2, 2.4 (2) 4.2, 1.8 (3) 8.4, 3.6 (4) 4.7, 2.8

Ans. **(2)**

69. A nuclear of mass number A emits a particle speed of a particle is v then what is recoil speed of nuclease.

(1) $\frac{Av}{A-1}$ (2) v (3) $\frac{v}{A-1}$ (4) $\left(\frac{A-1}{A}\right)v$

Ans. **(3)**

70. Fermer bone has base n average cross section area 100 cm^2 supporting mass of 40 kg of man find average pressure

(1) 4×10^4 (2) 2×10^4 (3) 3×10^{-4} (4) 5×10^{-4}

Ans. **(1)**

Sol. $P = \frac{Mg}{A} = \frac{40 \times 10}{100 \times 10^{-4}} = 4 \times 10^4$

71. Two wave in string have same velocity. If linear mass density of string are $\mu_1 = 5$, $\mu_2 = 20$ $T_1 = 40$ then, T_2 = ?

(1) 160 (2) 1600 (3) 150 (4) 1500

Ans. **(1)**

Sol. $\frac{40}{5} \times 20$

72. If 2 wire of length L_1 and L_2 and Young's modulus Y_1 and Y_2 are in series then effective Young's modulus is

(1) $\frac{y_1L_1 + y_2L_2}{L_1 + L_2}$ (2) $\frac{y_1L_2 + y_2L_1}{L_1 + L_2}$ (3) $\frac{y_1y_2(L_1 + L_2)}{L_1y_2 + L_2y_1}$ (4) $\frac{y_1 + y_2}{2}$

Ans. **(3)**

73. A positive charge particle is released in electric field in case (a) it is just released and in case (b) it has initial speed v_0 along electric field. If after sometime its kinetic energy in case (a) and (b) are k_1, and k_2 then

(1) $k_1 > k_2$ (2) $k_1 < K_2$ (3) $k_1 = K_2$ (4) None

Ans. **(2)**

74. Which of the following represents isotope, isobar isotones respectively ?

(1) (^1_1H, $^4_2$ He) (2) (^1_1H, ^4_2He)

(3) ($_1H^1$, $_1H^3$), ($_2He^3$, $_1H^3$) ($_{79}x^{197}$, $_{80}y^{190}$) (4) None of these

Ans. **(3)**

75. If accelerating voltage of X-ray tube is 13 kv find minimum wavelength of X-ray

$I = \frac{12400}{13k}$.

(1) 1 Å (2) 0.82 Å (3) 0.95 Å (4) 1.72 Å

Ans. **(2)**

76. If speed of sound in air is 340 m/s and in water 1480 m/s. If frequency of sound is 1000 kHz then find wavelength in water.

(1) 1.48 mm (2) 2.96 mm (3) 0.74 mm (4) 1 mm

Ans. **(1)**

Sol. $v = f\lambda$

$1480 = (1000\times10^3)\,\lambda$

$\lambda = 1.480$ mm

77. Loudness of sound defines on

(1) Amplitude (2) frequency (3) wavelength (4) velocity

Ans. **(1)**

78. A mass of 200 gm has initial velocity $V_i = 2\hat{i}+3\hat{j}$ and final velocity $-2\hat{i}-3\hat{j}$ find magnitude of change in momentum

(1) $|\Delta\vec{p}| = 0.8\hat{i}-1.2\hat{j}$ (2) $|\Delta\vec{p}| = 3.04$ (3) $|\Delta\vec{p}| = 2.04$ (4) $|\Delta\vec{p}| = 1.44$

Ans. **(4)**

79. A spring of spring constant k is cut into 3 equal part find k of each

(1) 3k (2) k/3 (3) k (4) none of these

Ans. **(1)**

80. 1000 N force is required to lift a hook and 10000 N force is requires to lift a load slowly. Find power required to lift hook with load with speed v = 0.5 m/sec

(1) 5 kw (2) 5.5 kw (3) 1.5 kw (4) 4.5 kw

Ans. **(2)**

Sol. P = F. V = (1000 + 1000) 0.5

$= \frac{11000}{2} = 5500 = 5.5$ kw

81. For nuclear reaction, select correct statement for released energy

(1) release energy per mass is more in fusion

(2) release energy per mass is more in fission

(3) release energy per atom is more in fusion

(4) equal in both for per mass and per atom

Ans. **(1)**

82. Density of sea water is more than that of fresh water then for a boat floating. What will be true

(1) boat will be lower in sea water than fresh water

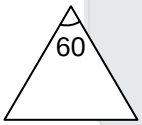
(2) boat will be lower in fresh water than sea water

(3) boat will be lower at same level in both

(4) none of these

Ans. **(2)**

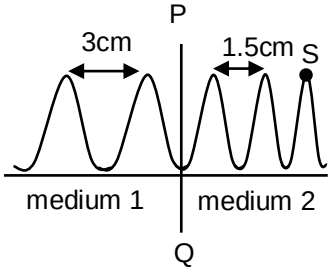
83. If minimum deviation = 30º then speed of light in prism



(1) $\frac{3}{\sqrt{2}}\times10^8$ m/s (1) $\frac{2}{\sqrt{3}}\times10^8$ m/s (1) $\frac{1}{\sqrt{2}}\times10^8$ m/s (1) $\frac{2}{3}\times10$ m/s

Ans. **(1)**

84. What is the ratio of speed of wave in medium 1 and 2.



(1) 2 : 1 (2) 1 : 2 (3) 1 : 1 (4) 3 : 1

Ans. (1)

PART – C (BIOLOGY)

85. Shape of chloroplast of Ulothrix is
(1) Star shaped (2) Bond shaped (3) Girdled shaped (4) Spinal
Ans. (3)

86. Which one is parasitic algae.
(1) Oedogonium (2) Cephaleuros (3) Spirogyra (4) Cladophera
Ans. (2)

87. Palmella statge is present in
(1) Aspergillus (2) Cystopus (3) Chlamydomonas (4) None
Ans. (3)

88. Payer's patches are present in
(1) Ileum (2) Jejunum (3) duodenum (4) sacculus rotandus
Ans. (1)

89. What is function of kupffer's cell
(1) Bile secretion (2) Digestion of lipid (3) Phagocytic (4) Digestion of protein
Ans. (3)

90. Histamine is secreted by
(1) Mast cells (2) kupffer's cells (3) oxyntic cells (4) Neutrophils
Ans. (1)

91. Which is not a derivative of cholesterol
(1) Vitamin B (2) Vitamin D (3) Bile salts (4) Steroid
Ans. (1)

92. Rooting plant hormone is
(1) IBA (2) 2, 4,-D (3) 2,4,5-T (4) NAA
Ans. (1)

93. Conditions required for cyclic photophosphorylation
(1) Aerobic condition, low light intensity (2) Aerobic condition, optimum light intensity
(3) Aerobic condition, low light intensity (4) Aerobic condition, optimum light intensit
Ans. (2)

94. R.Q of malic acid
(1) 1.9 (2) 1.49 (3) 1.33 (4) 1
Ans. (3)

95. Oxysome is composed of

(1) Lipid + carbohydrates (2) Lipid + protein

(3) Carbohydrates (4) Protein

Ans. **(4)**

96. Daily requirement of vitamin A for women

(1) 500 microgram (2) 700 microgram (3) 900 microgram (4) 300 microgram

Ans. **(2)**

97. Which is function of calcium

(1) Blood clotting (2) Muscular contraction

(3) Nerve Conduction (4) All of the above

Ans. **(4)**

98. Inhibin is composed of

(1) Glycoprotein (2) Lipoprotein (3) Steroid (4) Amino acid derivative

Ans. **(1)**

99. Formation of corpus luteum is induced by

(1) LH (2) Estrogen (3) FSH (4) Progesterone

Ans. **(1)**

100. Which is present in urine of pregnant woman

(1) HCG (2) LH (3) Estrogen (4) FSH

Ans. **(1)**

101. Poisonous Poison of mushroom inhibits formation of

(1) mRNA (2) rRNA (3) tRNA (4) hnRNA

Ans. **(4)**

102. What is ribotide

(1) Ribose + uracil + phosphate (2) Deoxyribose + uracil + phosphate

(3) deoxyribose + Thymine + phosphate (4) Ribose + Thymine + phosphate

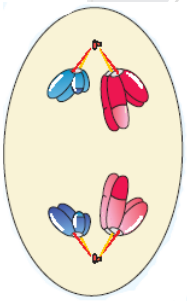
Ans. **(1)**

103. Which is formed in G_2

(1) mRNA (2) rRNA (3) DNA (4) tRNA

Ans. **(1)**

104.



Above diagram represents

(1) Anaphase-I (2) Metaphase-I (3) Telophase-I (4) Prophase-I

Ans. **(1)**

105. Cdk –inhibitor inhibit :
(1) P–53 (2) P – 21 (3) P – 21 (4) None
Ans. **(1)**

106. Cell wall of fungi is composed of:
(1) Chitin (2) Pectin (3) Cellulose (4) Mannans
Ans. **(1)**

107. Which motile-stage of protozoa is helpful in feeding?
(1) Pseudopodium (2) Cilia (3) Flagella (4) Tentacles
Ans. **(1)**

108. Which one mRNA can be transcripted :
(1) AUG.UGA.UUU (2) UAA.UAV.UGG (3) UAG.UGA.UUV (4) UGA.UUV.UGG
Ans. **(1)**

109. Purkinje's fibres are found in :
(1) Heart (2) Liver (3) Brain (4) Lungs
Ans. **(1)**

110. Function of hypothalamus is :
(1) Thermoregulation (2) Water balance
(3) Control of hormone function (4) All of above
Ans. **(4)**

111. Caryopsis is present in :
(1) Wheat (2) Groundnut (3) Coconut (4) Mango
Ans. **(1)**

112. Which one is anti-allergic antibody:
(1) Ig A (2) Ig G (3) Ig E (4) Iq D
Ans. **(3)**

113. What is role of sterol in cell membrane :
(1) Stability (2) Communication with other cells
(3) Secretion (4) Transport
Ans. **(1)**

114. AB blood group shows :
(1) Co-dominance (2) Incomplete dominance
(3) Polygenic inheritance (4) Pleiotropy
Ans. **(1)**

115. During apoptosis why adjust tissues are not inflamed:
(1) Phagocytes or macrophages are not involved.
(2) Process involve killing of cell due to reduced blood supply
(3) DNA of cell doesn't have genes for apoptosis
(4) Basophils and eosinophil play an important role
Ans. **(1)**

116. Which is derived from triterpenes

(1) Cholesterol (2) Growth hormone (3) Thyroxin (4) Vitamin B_{12}

Ans. **(1)**

117. Non-disjunction in meiosis results in :

(1) Trisomy (2) Normal diploid (3) Gene mutation (4) None

Ans. **(1)**

118. XXY genotype shows :

(1) Male (2) Hermaphrodite (3) Female (4) Super female

Ans. **(2)**

119. Which of these is incorrect for C_4-plants

(1) kranz anatomy (2) CO_2 acceptor is PEP

(3) PEPcase in mesophyll (4) RUBISCO in mesophyll

Ans. **(4)**

120. Which is incorrect for chloroplast

(1) Presence in algae and plants (2) Release O_2

(3) Occurs only in cells with aerobic respiration (4) None

Ans. **(3)**

121. Non-essential amino acid is

(1) Valine (2) Arginine (3) Histidine (4) Lysine

Ans. **(1)**

122. Which of these is an extension of nuclear membrane and involved in secretion out of cell

(1) ER (2) Golgi body (3) Ribosome (4) Lysosome

Ans. **(1)**

123. Protein are needed in diet because

(1) All amino acids are not available in body (2) During fasting body utilized proteins

(3) Proteins act as building blocks of our body (4) All of the above

Ans. **(4)**

124. Protein uptake in nucleus occurs by

(1) ATP hydrolysis in cytoplasm (2) GTP hydrolysis in cytoplasm

(3) ATP hydrolysis in nucleus (4) GTP hydrolysis in nucleus

Ans. **(1)**

125. Omega 3 fatty acid is present in

(1) Sun flower oil (2) Flax seed oil (3) Ground nut oil (4) Butter

Ans. **(2)**

126. Which is incorrect for non-disjunction

(1) Homologous chromosomes are not separated in meiosis-I

(2) Sex chromatids are not separated in meiosis-II

(3) Crossing over occurs b/w non sister chromatids in mitosis

(4) Crossing over occurs b/w non sister chromatids in meiosis-I

Ans. **(3)**

127. Correct sequence is:

(1) Zygote → cleavage → Morula → Blastula → Gastrula

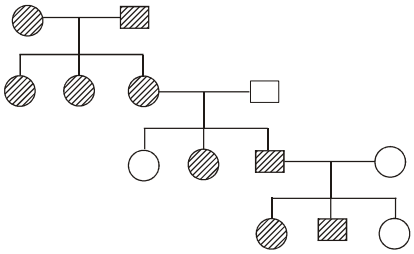
(2) Cleavage → Zygote → Morula → Blastula → Gastrula

(3) Zygote → Morula → Blastula → cleavage → Gastrula

(4) Zygote → Blastula → Morula → cleavage → Gastrula

Ans. (1)

128.



(1) Autosomal dominant (2) X-Linked dominant

(3) Autosomal recessive (4) X-Linked recessive

Ans. (1)

129. Which is correct for low glycemic index of food except:

(1) Release glucose slowly (2) Induce quick release of insulin

(3) harmful for diabetic patient (4) Adversely affect blood glucose levels

Ans. (1)

130. Which is used in tissue culture

(1) Explant (2) Somaclones (3) Hybridization (4) None

Ans. (1)

131. Gene transfer is present in :

(1) Biolistics (2) Hybridization (3) Tissue culture (4) Vegetative propagation

Ans. (1)

132. Linker-DNA is attached to

(1) H_1 (2) H_2A (3) H_2B (4) H_3

Ans. (1)

133. What is acrosomal reaction?

(1) Contact of sperms with egg (2) Digestion of zona pellucida

(3) Disintegration of acrosome (4) Contact of acrosome and nucleus of egg

Ans. (2)

134. Which is present at 5' end of eukaryotic m-RNA

(1) Poly A tail (2) Modified C at 5' (3) 7 mG (4) Poly C

Ans. (3)

135. ATCCAG DNA form which mRNA

(1) UAGGUC (2) TAGGTC (3) (4)

Ans. (1)

136. Loss of water from body occurs by all of the following except

(1) Muscles (2) Lungs (3) Kinney (4) skin

Ans. (1)

137. Pollen kitt is present in

(1) Anemophilly (2) Entamophily (3) Malacophilly (4) Zoophilly

Ans. (2)

138. How many molecules of pyruvic acid are formed in glycolysis

(1) 2 (2) 1 (3) 15 (4) 16

Ans. (1)

139. Molecular formula of chl.b is

(1) $C_{55}H_{70}O_6N_4Mg$ (2) $C_{55}H_{72}O_5N_4Mg$ (3) $C_{55}H_{70}O_5N_4Mg$ (4) $C_{54}H_{70}O_6N_4Mg$

Ans. (1)

PART - D : ENGLISH & COMPREHENSION + LOGICAL & QUANTITATIVE REASONING

140. 0, 4, 18, 48, ?, 180

(1) 58 (2) 100 (3) 64 (4)

Ans. **(2)**

141. Rajesh said pointing at a women in photo "her maternal grandfather's only daughter is my wife". How in Rajesh related to that women?

(1) Uncle (2) Father (3) Maternal uncle (4) Brother

Ans. **(2)**

142. Using the first, fifth, seventh and ninth letter of "PUNCTUATE" how many words can be made using them only once?

(1) None (2) Two (3) Three (4) Four

Ans. **(3)**

Sol. **(tape, peat, pate)**

143. Complete the series: ZA2, XE3, VI5, TO7.....

(1) RU11 (2) RU9 (3) RU8 (4) RV11

Ans. **(1)**

144. (i) Some trains are cars.
(ii) All cars are branches.
(iii) All branches are nests.
(iv) Some nests are dresses.
Conclusions :
(I) Some dresses are cars
(II) Some nests are trains

(1) Only option I follows (2) Only option II follows
(3) Both I & II follows (4) Neither I nor II follows

Ans. **(2)**

145. A boy starts running towards south, then takes right turn, runs for some time then turns right and then turns left what is his direction now :

(1) West (2) South (3) North (4) East

Ans. **(1)**

146. In a class of 30 students, X & Y are at 13^{th} and 14^{th} position from top, what is their rank from bottom?

(1) 18 & 19 (2) 15 & 16 (3) 16 & 17 (4) 18 & 17

Ans. **(4)**