

FIRST YEAR HIGHER SECONDARY EXAMINATION, MARCH/ SEPT. 20.17.
(Scheme of Valuation)

Subject: English

Code No: 661

Qn.No	Scoring Indicators	Split Score	Total Score
1.	Sleep	1	1
2.	Onymoron	1	1
3.	Comprehensiveness Expressions	2 } 1 }	3
4.	Appropriate answer from the passage	1	1
5.	Appropriate answer from the passage	1	1
6.	Title Comprehensiveness of the Content Precision	1 2 1	1 } 2 } 1 } 4
7.	Comprehensiveness Logical presentation Appropriateness of language	2 } 2 } 1 }	5
8.	in, of, off, for, off	1x5	5
9.	Comprehensiveness Annoting incidents from the story Appropriate language/expressions	2 } 2 } 1 }	5

Qn.No	Scoring Indicators	Split Score	Total Score
10.	I asked the girl whether she came that way. She answered affirmatively and said that she worked as a typist in the Civil Services Stores and that every afternoon she came home that way and that day was Saturday and so she was off early.	5	5
11.	Comprehensiveness of the speech Appropriate language/ expression	2 2	4
12.	Comprehensiveness / Any 4 Suitable arguments	4	4
13.	Comprehensiveness Logical presentation Appropriate language/ clarity	2 2 1	5
14	Asking appropriate questions	1 x 3	3
15.	Comprehensiveness, experiences, personal impressions creativity Appropriateness of language	4 1 1	4 1 1
			6

Qn.No	Scoring Indicators	Split Score	Total Score
16	Completeness of the content Organization, lay out & legibility Originality	3 2 1	6
17	Comprehensiveness Originality Appropriate expressions	2 2 1	5
18	Whereas, now, and, but	1x4	4
19	Appropriateness of the exchanges Proper communication of ideas Use of appropriate language elements	2 1 1	4
20	Comprehensiveness of the content Relevance of the content (theme, poetic devices if any) Originality Neatness & legibility	4 2 1 1	8

FIRST YEAR HIGHER SECONDARY EXAMINATION, MARCH/ SEPT. 2017..
(Scheme of Valuation)

Subject: MALAYALAM.

Code No: 662.

Qn.No	Scoring Indicators	Split Score	Total Score
1.	അദ്ധ്യക്ഷി.	1	1
2.	വെള്ളാല	1	1
3.	മൈക്കിൾ ജൂലിയറ്റ് ബെക്കിൾ.	1	1
4.	മൈക്കിൾ ജൂലിയറ്റ്	1	1
5.	മൈക്കിൾ.	1	1
6.	മൈ.വി. രാജാജി.	1	1
7.	മൈ.വി.	1	1
8.	മൈ.	1	1
9.	മൈ.വി.	1	1
10.	മൈ.വി.	1	1
11.	മൈ.വി. - മി. വി. രാജാജി.	1	1
12.	മൈ.വി. രാജാജി - മി. വി. രാജാജി.	1	1
13.	മൈ.വി. - മി. വി. രാജാജി.	1	1
14.	മൈ.വി. രാജാജി - മി. വി. രാജാജി.	1	1
15.	മൈ.	1	1
16.	മൈ.	1	1
17.	മൈ.വി. രാജാജി - മി. വി. രാജാജി.	2	2
18.	മൈ.വി. രാജാജി - മി. വി. രാജാജി.	1	1
	2) മൈ.വി. രാജാജി - മി. വി. രാജാജി.	2	3

Qn.No	Scoring Indicators	Split Score	Total Score
19	1. ആരംഭം മനസ്സിലാക്കിയിട്ടുണ്ട്.	1	3.
	2. കൃത്യമായി ആവിഷ്കരിച്ചിട്ടുണ്ട്.	2	
20	1. ലളിതമായ ഭാഷയിൽ ആവിഷ്കരിച്ചിട്ടുണ്ട്.	1	3
	2. കവിതയുടെ ഭാഗ്ഗാത്മികതയും കർമ്മത്തിലുമുണ്ട്.	2	
21.	1. കവിതയുടെ ആരംഭം മനസ്സിലാക്കിയിട്ടുണ്ട്.	1	3.
	2. ലളിതമായി വിശദീകരിച്ചിട്ടുണ്ട്.	2	
22.	1. തനിമയോടെ നിരീക്ഷണം നടത്തിയിട്ടുണ്ട്.	1	3.
	2. ബാഹ്യരൂപം കൃത്യം കർമ്മത്തിലുമുണ്ട്.	2	
23.	1. മനസ്സിലാക്കിയിട്ടുണ്ട്.	1	3.
	2. വിശദീകരിച്ചിട്ടുണ്ട്.	2	
24.	1. ലളിതമായ ഭാഷയിൽ ആവിഷ്കരിച്ചിട്ടുണ്ട്.	2	5
	2. ആശയം കർമ്മത്തിലുമുണ്ട്.	3	
25.	1. ലളിതമായി ആവിഷ്കരിച്ചിട്ടുണ്ട്.	2	5.
	2. വിശദീകരിച്ചിട്ടുണ്ട്.	3	

Qn.No	Scoring Indicators	Split Score	Total Score
26.	1. പാഠഭാഗത്തിന്റെ ആനുകൂല്യം ഉൾക്കൊണ്ടിട്ടുണ്ട്.	2	5.
	2. വികാരതീവ്രമായി ആവിഷ്കരിച്ചിട്ടുണ്ട്.	3	
27.	1. രസാധിഷ്ഠിതമായി ആവിഷ്കരിച്ചിട്ടുണ്ട്.	1	5.
	2. കഥയുടെ ഉത്ഭവം വ്യക്തമാക്കിയിട്ടുണ്ട്.	2	
	3. ആദ്യകാല ചെറുകഥയുടെ ചെറുതുമ്പുപോലെ മനോഹരമായിയിട്ടുണ്ട്.	2	
28.	1. ചരിത്രപരമായ അനുഭവങ്ങൾ ഉൾക്കൊള്ളിയിട്ടുണ്ട്.	2	8
	2. സാഹിത്യം നിരീക്ഷണങ്ങൾ ആവിഷ്കരിച്ചിട്ടുണ്ട്.	2	
	3. അപ്രകാരം കാരണം കണ്ടെത്തുവാൻ സാധിക്കാത്തതായിട്ടുണ്ട്.	2	
	4. ഭാഷാപരമായ മികവ് ഉൾക്കൊള്ളിയിട്ടുണ്ട്.	2	
	OK.		
	1. ഉപന്യാസത്തിന്റെ രസം മനോഹരമായിയിട്ടുണ്ട്.	2	8.
	2. സാഹിത്യം നിരീക്ഷണങ്ങൾ അനുഭവമായിയിട്ടുണ്ട്.	2	
	3. കഥയുടെ ആനുകൂല്യം വ്യക്തമാക്കിയിട്ടുണ്ട്.	2	
	4. മനോഹരമായ കഥാ രചനാശൈലി ആകൃഷ്ട ചർച്ചാപരമായതായി കണ്ടെത്തുവാൻ സാധിക്കാത്തതായിയിട്ടുണ്ട്.	2	

Qn.No	Scoring Indicators	Split Score	Total Score
29.	1. ഉപന്യാസ ധ്വജം തിരിച്ചിട്ടുണ്ട്.	2	8.
	2. പിന്നീട് ഡോക്യുമെന്റേഷൻ.	3	
	3. പിന്നീട് തിരിച്ചെടുക്കൽ തിരിച്ചെടുക്കൽ ഡോക്യുമെന്റേഷൻ.	3	
	OR		
	1. ജീവിതരത്ന മുദ്രിതമായ കമ്മ്യൂണിറ്റി ഓഫീസ് തിരിച്ചിട്ടുണ്ട്.	2	8
	2. കോർഡിനേറ്റ് നിഗമനത്തിൽ അന്തിമമായിട്ടുണ്ട്.	3	
	3. താരതമ്യ ഉപയോഗത്തിൽ നിന്ന് നേടിയിട്ടുണ്ട്.	3	
30.	1. ഉപന്യാസ ധ്വജം തിരിച്ചിട്ടുണ്ട്.	2	8.
	2. ഡോക്യുമെന്റേഷൻ നേടിയിട്ടുണ്ട്.	2	
	3. കഥ ഉൾക്കൊള്ളിയിട്ടുണ്ട്.	2	
	4. അക്ഷരകേന്ദ്രമായ പ്ലാറ്റ്ഫോം തിരിച്ചിട്ടുണ്ട്.	2	
	OR		
	1. ഉപന്യാസത്തിന്റെ ധ്വജം തിരിച്ചിട്ടുണ്ട്.	2	8
	2. വിഷയത്തിന്റെ ഡോക്യുമെന്റേഷൻ ഉപയോഗിച്ച് ഉൾക്കൊള്ളിയിട്ടുണ്ട്.	3	
	3. കാരണങ്ങളും ഫലങ്ങളും നിർദ്ദേശിക്കാൻ തിരിച്ചിട്ടുണ്ട്.	3	

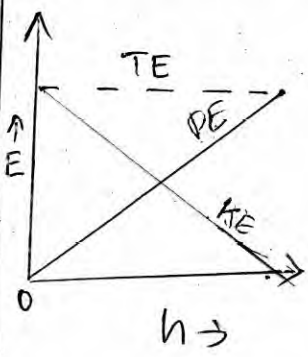
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FIRST YEAR HIGHER SECONDARY EXAMINATION, MARCH/ SEPT. 20.17.
(Scheme of Valuation)

Subject: PHYSICS

Code No: 663

Qn.No	Scoring Indicators	Split Score	Total Score
1	a. Aeroplane : Bernoulli's Principle (1/2) b. Steam engine: Laws of thermodynamics (1/2)	1	1
2	a. Planetary Motion b. Joule/kg/K c. Moment of force	1 1 1	3
3	a. Principle of homogeneity of dimensions b. (i) Statement (1 Score) (ii) force-weight (1/2) momentum-impulse (1/2) pressure-stress (1/2) work-energy (1/2)	1 3	4
4	a) (iii) b) Displacement = Area of $\triangle ODA$ + Area of $\square ABED$ + Area of $\triangle BEC$ (1)	1	

Qn.No	Scoring Indicators	Split Score	Total Score
	$\text{Displacement} = \frac{1}{2} \times 4 \times 100 + 4 \times 100$ $+ \frac{1}{2} \times 4 \times 100 = 800\text{m} \quad (2)$	3	4
5	a. Diagram (1) Derivation of maximum height (1½) Time of flight (1½) b. 45°	4 1	5
5.	OR a. Parallelogram law of vector addition b. Diagram (1) Derivation of $R = \sqrt{P^2 + Q^2 + 2PQ \cos \theta} \quad (3)$	1 4	5
6	a. Law of conservation of linear momentum b. Statement (1) $F = \frac{dp}{dt}$	1	

Qn.No	Scoring Indicators	Split Score	Total Score
	$1f \quad F_{ext} = 0$ $\frac{dP}{dt} = 0 \quad (1)$ $P = \text{constant}$ c. $m = 0.020 \text{ kg}$ $M = 100 \text{ kg}$ $V = 80 \text{ m/s}$ $mU + MV = 0 \quad (1)$ $V = -\frac{mU}{M} = \frac{0.020 \times 80}{100}$ $= -0.016 \text{ m/s} \quad (1)$	2 2	 5
7	a. Statement b. (ii) $h/2$ 	2 1 2	 5
8	a. Statement b. $I_{AB} = I_{PP} + Ma^2 \quad (1/2)$	2	

Qn.No	Scoring Indicators	Split Score	Total Score
	$I_{AB} = \frac{ml^2}{12} + m(l/2)^2 \quad (1)$ $= \frac{ml^2}{3} \quad (1/2)$	2	4
9	Escape velocity (1) $KE = \frac{1}{2} m v_e^2 \quad (1/2)$ $PE = - \frac{G M_E m}{R_E} \quad (1/2)$ At infinity $\frac{1}{2} m v_e^2 - \frac{G M_E m}{R_E} = 0 \quad (1)$ $v_e = \sqrt{\frac{2 G M_E}{R_E}} \quad (1)$	4	4
10	a. False b. A (1) Explanation based on ultimate stress (1)	1 2	3
11	a. (1) As height increases pressure decreases (1)		

Qn.No	Scoring Indicators	Split Score	Total Score
	Explanation (1) b. Figure (1) $P_a + \frac{1}{2} \rho V_1^2 + \rho g y_1 = P + \rho g y_2$ $V_1 = \sqrt{2gh + \frac{2(P-P_0)}{\rho}} \quad (1/2)$ $P = P_0 \quad (1/2)$ $V_1 = \sqrt{2gh} \quad (1)$ Statement (1)	2 4	6
11	OR a. $V = \frac{2r^2(\rho - \sigma)g}{9\eta}$ $V \propto r^2$ (1) explanation (1) b. (i) weight of ball upthrust viscous force (1) (ii) Terminal velocity (1/2) (iii) weight = $mg = \frac{4}{3}\pi r^3 \rho g$ upthrust = $\frac{4}{3}\pi r^3 \sigma g$ Viscous force = $6\pi\eta r V_t$ (1)	2	

Qn.No	Scoring Indicators	Split Score	Total Score
	At equilibrium, $\frac{4}{3}\pi r^3 \rho g = \frac{4}{3}\pi r^3 \sigma g + 6\pi \eta r v$ $v_t = \frac{2r^3(\rho - \sigma)g}{9\eta} \quad (1)$	4	6
12.	a. As he heats iron rim, linear expansion occurs (1) Become fit after cooling (1) b. $P = \frac{2}{3} \times h\nu$ mean KE (1/2) As gas is heated KE increases and pressure (1/2) increases	2 2	4
13	a (i) isothermal expansion (ii) isothermal compression b (i) $Q_1 = 1000 \text{ J}$ $Q_2 = 600 \text{ J}$ $T_1 = 400 \text{ K}$ $\eta = \frac{Q_1 - Q_2}{Q_1} = \frac{1000 - 600}{1000}$ $= 40\% \quad (1/2)$	1	

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Scoring Indicator

Split
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Score

$$(ii) \frac{\phi_1 - \phi_2}{\phi_1} = \frac{T_1 - T_2}{T_1}$$

$$\frac{\phi_1}{\phi_2} = \frac{T_1}{T_2}$$

$$T_2 = \left(\frac{600}{1000}\right) \times 400 = 240K$$

$$= -33^\circ C \quad (1\frac{1}{2})$$

3

4

14 a. $T = 2\pi \sqrt{l/g}$ (1)

As she stands up l decreases

$\therefore T$ decreases (1)

2

b. As height increases
 g decreases (1)

Since $T = 2\pi \sqrt{l/g}$

$\therefore T$ increases

loss of time (1)

2

4

15 a. Doppler effect

1

b. $\gamma = \gamma_0 \left[\frac{V - V_o}{V - V_s} \right]$ (1)

Here $V_o = 0$

$V_s = -ve$

(1)

3

4

$\gamma = \gamma_0 \left[\frac{V}{V + V_s} \right]$ (1)

FIRST YEAR HIGHER SECONDARY EXAMINATION, MARCH/ SEPT. 2015. 2017
(Scheme of Valuation)

Subject:

Chemistry

Code No:

664

Qn.No	Scoring Indicators	Split Score	Total Score
1 a. 4	state any two laws	1 1x2=2	
c	molecular mass: At. mass of C + Fixed mass of H i.e. $12 + 4 \times 1 = 16$	1	4
2.	Name any two quantum nos:  - s  - 2p no. of protons = 17, no. of neutrons = 18	1 4/1=2 1 1 $\frac{1}{2} + \frac{1}{2}$	5
3. a)	Explain s, p, d and f block: (1) general electronic configuration (2) position in the periodic table (3) 1 Example etc. any 2 points each.	1x4 = 4	4
b)	Stating the concepts or Simple explanation	1x4=4	

Qn.No	Scoring Indicators	Split Score	Total Score
4.	a) (i) BeCl_2 (ii) BCl_3 (iii) CH_4 (iv) SF_6 b) Any three postulates of VSEPR or Any 3 features of MO theory	$\frac{1}{2} \times 4 = 2$ $1 \times 3 = 3$ $1 \times 3 = 3$	5
5.	a. $V = kT$ b. $PV = nRT$ c. any 3 postulates	1 1 $1 \times 3 = 3$	5
6.	a. Write any one difference each with example. b. Stating with example	1+1 2	4
7.	a) BCl_3 b) $K = \frac{[\text{NH}_3]^2}{[\text{N}_2][\text{H}_2]^3}$ c. 2, acidic since pH is less than 7	1 1 1+1	4

Qn.No	Scoring Indicators	Split Score	Total Score
8	a) (i) $^+6$ (ii) $_{+4}$ b) any definition	2 1	3
9	a) Any two differences between hard water and soft water b) Write any one method c) representing the str. in gas phase or solid phase	$\frac{1}{2} \times 4 = 2$ 1 1	4
10	a) (i) NaOH (ii) $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$ (iii) CaO (iv) NaHCO_3 b) Write any two reasons	$\frac{1}{2} \times 4 = 2$ 2 1+1	4
11	a) Method of preparation b) Represent the structure c) Solid CO_2	1 2 1	4
12	a) (i) 3-Bromohexane (ii) 2,3-dibromobenzene b) any 2 methods	$1 \times 2 = 2$ 1+1	Explanation:

Qn.No	Scoring Indicators	Split Score	Total Score
C.	CH_3^+	1	6
13	a)  + Cl₂ →  b) Any one reaction or equation c. (i)  (ii)  (iii) CH₂=CH₂	1 1 1 x 3 = 3	5
14	(i) Any 2 causes (ii) Amount of O₂ required by bacteria to break down the organic matter present in a certain vol. of a sample of water	1 x 2 1	3

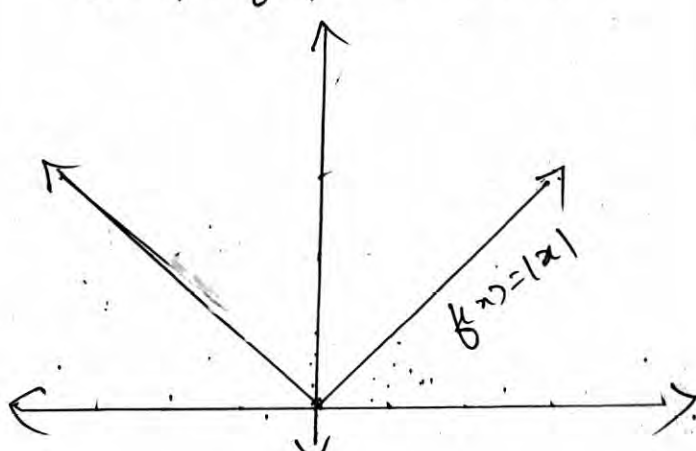
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MARCH/SEPT 20

FIRST YEAR H. S. S. EXAM,

Subject: Mathematics

Code No: 665

Qu. No	Scoring Indicators	Split Score	Total Score
1	(a) $\{ (1, 3) \}$ (b) $A \cap B = \{ 3 \}$ $(A \cap B)' = \{ 1, 2, 4, 5, 6, 7 \}$ $A' = \{ 4, 5, 6, 7 \}$ $B' = \{ 1, 2, 6, 7 \}$ $A' \cup B' = \{ 1, 2, 4, 5, 6, 7 \}$ (c) $n(C) = 24$ $n(F) = 16$ $n(C \cup F) = 35$ $n(C \cap F) = ?$ $n(C \cap F) = n(C) + n(F) - n(C \cup F)$ $= 24 + 16 - 35$ $= 40 - 35 = 5$ 5 students like to play both the games	1 1 1 1	5

Qu. No	Scoring Indicators	Split Score	Total Score
2	(a) $\{(2, 8), (3, 27), (5, 125), (7, 343)\}$ (b) Domain = $\{2, 3, 5, 7\}$ Range = $\{8, 27, 125, 343\}$ (c) $f(x) = x$ For table For x & y axes Graph of $f(x) = x$ 	1 1 1 1 1 1 1	6

Qu. No	Scoring Indicators	Split Score	Total Score
3	(a) $\frac{5\pi}{36}^c$ (b) $\cos A \cos B - \sin A \sin B$ $= \cos(x+y)$ $\Rightarrow \cos(\pi/4 - x) \cos(\pi/4 - y) -$ $\sin(\pi/4 - x) \sin(\pi/4 - y)$ $= \cos\left(\frac{\pi}{4} - x + \frac{\pi}{4} - y\right)$ $= \cos\left(\frac{\pi}{2} - (x+y)\right)$ $= \sin(x+y)$ (c) $\cos 4x = \cos 2x$ $\cos x = \cos y \Rightarrow x = 2n\pi \pm y$ $\therefore \cos 4x = \cos 2x \Rightarrow 4x = 2n\pi \pm 2x$ $\Rightarrow 2x = 2n\pi$ or $6x = 2n\pi$ $\Rightarrow x = n\pi$ or $x = \frac{n\pi}{3}$	1 1 1 1 1 1	6

Qu. No	Scoring Indicators	Split Score	Total Score
3	OR a) 300° (b) $\sin \theta = \frac{12}{13}$ $\cos^2 \theta = 1 - \sin^2 \theta$ $= 1 - \frac{144}{169}$ $= \frac{25}{169}$ $\cos \theta = \frac{5}{13}$ $\sin 2\theta = 2 \sin \theta \cos \theta$ $= 2 \times \frac{12}{13} \times \frac{5}{13}$ $= \frac{120}{169}$ (c) $A + B = \pi/4$ $\tan(A + B) = \tan \pi/4 = 1$ $\frac{\tan A + \tan B}{1 - \tan A \tan B} = 1$ $\tan A + \tan B = 1 - \tan A \tan B$ $1 + \tan A + \tan B + \tan A \tan B = 2$ $(1 + \tan A)(1 + \tan B) = 2$	1 1 1 1	6

Qu. No	Scoring Indicators	Split Score	Total Score
4	let $P(n) \equiv 7^n - 3^n$ is divisible by 4 $P(1) = 7 - 3 = 4$ which is divisible by 4 Assume that $P(k)$ is true for some natural no. k To P.T $P(k+1)$ is true $7^{k+1} - 3^{k+1} = 7^{k+1} - 7 \cdot 3^k + 7 \cdot 3^k - 3^{k+1}$ $= 7(7^k - 3^k) + 3^k(7 - 3)$ which is divisible by 4 Thus $P(k+1)$ is true when $P(k)$ is true Hence by the principle of M.I, the result is true, for $n \geq 1$	1 1 1	4.

Qu. No	Scoring Indicators	Split Score	Total Score
5	(a) $(-\infty, 1)$ (b) For x & y axes graph of $2x + y = 4$ graph of $x + 2y = 6$ Shaded part	1 1 1 1	5

Qu. No	Scoring Indicators	Split Score	Total Score
6.	(a) 3 (b) (i) let $z = \sqrt{3} + i$ Modulus 'r' = $\sqrt{3+1}$ $= \underline{\underline{2}}$ $\tan \theta = \frac{1}{\sqrt{3}}$ $\theta = \underline{\underline{\pi/6}}$ (ii) $z = r(\cos \theta + i \sin \theta)$ $= 2 \left(\cos \frac{\pi}{6} + i \sin \frac{\pi}{6} \right)$ Student can write the answer in his own way.	1 1 1 1 1	5

Qu. No	Scoring Indicators	Split Score	Total Score
7	(a) 9 (b) $n P_2 = 30$ $\frac{n!}{(n-2)!} = 30$ $\frac{n(n-1)(n-2)!}{(n-2)!} = 30$ $n(n-1) = 30$ $n^2 - n - 30 = 0$ $n = 6 \text{ or } n = -5$ $\therefore \Rightarrow n = 6$ (c) Between 100 and 1000 there are 3 digit numbers 1st place can be filled by 2 or 9 in 2 ways. II " 2 ways III " 2 ways Total no. of 3 digit numbers = $2 \times 2 \times 2 = \underline{\underline{8}}$	1 1 1 1 1	6

Qu. No	Scoring Indicators	Split Score	Total Score
7	OR (a) 17. (b) ${}^{2n}C_3 : {}^nC_3 = 12 : 1$ $\frac{{}^{2n}C_3}{{}^nC_3} = \frac{12}{1}$ $\frac{2n \cdot (2n-1) \cdot (2n-2)}{n \cdot (n-1) \cdot (n-2)} = 12$ $4(2n-1) = 12(n-2)$ $8n-4 = 12n-24$ $4n = 20$ $n = \underline{\underline{5}}$ (c) 3 girls can be selected from 4 girls in ${}^4C_3 = \underline{\underline{4 \text{ ways}}}$ Remaining 4 can be selected from 9 boys in ${}^9C_4 = \underline{\underline{126 \text{ ways}}}$ Committee consists exactly 3 girls	1 1 1	

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Qu. No	Scoring Indicators	Split Score	Total Score
	in $126 \times 4 = \underline{504 \text{ ways}}$ (11) At least 3 girls means ① exactly 3 girls ② exactly 4 girls Exactly 4 girls can be selected in $4C_4 \times 9C_3$ $= \underline{84 \text{ ways}}$ Hence the committee consists of <u>at least</u> 3 girls $= 504 + 84$ $= \underline{588 \text{ ways}}$	1 1 1 1	6

Qu. No	Scoring Indicators	Split Score	Total Score
8	(a) $15C_3$ (b) $T_{r+1} = {}^nC_r a^{n-r} b^r$ $T_4 = (-1)^3 {}^{12}C_3 x^9 (2y)^3$ $= -1 \times 220 \times 8x^9y^3$ $= \underline{\underline{-1760x^9y^3}}$ (c) Middle term = 5th term $T_5 = {}^8C_4 x^4 (2y)^4$ $= {}^8C_4 x^4 \cdot 16y^4$ $= \underline{\underline{1120x^4y^4}}$	1 1 1 1	5

Qu. No	Scoring Indicators	Split Score	Total Score
9	(a) 25 (b) $S_n = 7 + 77 + 777 + \dots$ $+ n \text{ terms}$ $= \frac{7}{9} (9 + 99 + 999 + \dots$ $+ n \text{ terms})$ $= \frac{7}{9} ((10 - 1) + (10^2 - 1) + \dots$ $+ n \text{ terms})$ $= \frac{7}{9} \left[10 + 10^2 + 10^3 + \dots + 10^n - (1 + 1 + \dots + 1) \right]$ $= \frac{7}{9} \left[\frac{10(10^n - 1)}{9} - n \right]$ $= \frac{7}{81} [10(10^n - 1) - 9n]$ (c) 5, $4k - 6$, 7 are in AP $t_2 - t_1 = t_3 - t_2$ $4k - 6 - 5 = 7 - 4k + 6$ $\Rightarrow 8k = 24$ $\Rightarrow k = \underline{\underline{3}}$	1 1 1 1 1	5

Qu. No	Scoring Indicators	Split Score	Total Score
9	(a) 3 <u>OR</u> (b) $S_{\infty} = \frac{a}{1-r}$ $a = 1, r = -\frac{1}{2}$ $S_{\infty} = \frac{1}{1-(-1/2)} = \frac{2}{3}$ (c) 1, $t_2, t_3, 64$ bc the G.P. $t_4 = 64$ $a r^3 = 64$ $1 \cdot r^3 = 64 \Rightarrow r = 4$ $t_2 = 4, t_3 = 16$ 4 & 16 are the two G. ms b/w 1 & 64	1 1 1 1 1	5

Qu. No	Scoring Indicators	Split Score	Total Score
10	(a) $\sqrt{3}$ (b) Slope of the given line $= -3/4$ Slope of the $\perp$ line $= 4/3$ Equation is $y + 5 = \frac{4}{3}(x - 4)$ $3y + 15 = 4x - 16$ $\underline{4x - 3y - 31 = 0}$ (c) Lines are $3x - 4y + 7 = 0$ $3x - 4y + 5 = 0$ $d = \frac{ C_2 - C_1 }{\sqrt{A^2 + B^2}}$ $= \frac{ 2 }{\sqrt{9 + 16}} = \underline{\underline{\frac{2}{5}}}$	1 1 1 1 1 1	6

Qu. No	Scoring Indicators	Split Score	Total Score
10	OR. (a) -2 (b) $d = \frac{ Ax_1 + By_1 + C }{\sqrt{A^2 + B^2}}$ $= \frac{ 9 + 20 - 26 }{\sqrt{9 + 16}}$ $= \frac{3}{5}$ (c) $\tan \theta = \left \frac{m_2 - m_1}{1 + m_1 m_2} \right$ $m_1 = -\sqrt{3}$ $m_2 = -\frac{1}{\sqrt{3}}$ $= \left \frac{-\frac{1}{\sqrt{3}} + \sqrt{3}}{1 + 1} \right $ $= \left \frac{-1 + 3}{2\sqrt{3}} \right $ $= \left \frac{2}{2\sqrt{3}} \right = \frac{1}{\sqrt{3}}$ $\Rightarrow \theta = 30^\circ$ or $\theta = 150^\circ$	1 1 1 1 1 1 1	6

Qu. No	Scoring Indicators	Split Score	Total Score
11	(a) 12 (b) $9x^2 + 4y^2 = 36$ $\frac{x^2}{4} + \frac{y^2}{9} = 1$ $b = 2, a = 3$ $c = \sqrt{a^2 - b^2} = \underline{\underline{\sqrt{5}}}$ $e = \frac{c}{a} = \frac{\sqrt{5}}{3}$ length of the latus <u>rectum</u> $= \frac{2b^2}{a}$ $= \frac{2 \times 4}{3}$ $= 8/3 //$ Foci $(0, \pm \sqrt{5})$	1 1 1 1	4

Qu. No	Scoring Indicators	Split Score	Total Score
12	(a) 7th octant (b) let A & B be the given points. let yz plane divides it ^{the line AB} in the ratio k:1 at P(x, y, z) then $\left(\frac{4+6k}{k+1}, \frac{8+10k}{k+1}, \frac{10-8k}{k+1} \right)$ is the co-ordinate of P P lies in the yz plane; x co-ordinate = 0 $\frac{4+6k}{k+1} = 0$ $\Rightarrow k = -2/3$ $\Rightarrow$ yz plane divides AB externally in the ratio <u>2:3</u>	1 1 1	3

Qu. No	Scoring Indicators	Split Score	Total Score
13	(a) (i) Ans - 5 (ii) Ans - 2 (iii) Ans - 3 (b) let $y = \sin x = f(x)$ $\frac{dy}{dx} = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ $= \lim_{h \rightarrow 0} \frac{\sin(x+h) - \sin x}{h}$ $= \lim_{h \rightarrow 0} \frac{2 \cos\left(\frac{2x+h}{2}\right) \sin \frac{h}{2}}{h}$ $= \lim_{h \rightarrow 0} \cos\left(x + \frac{h}{2}\right) \frac{\sin \frac{h}{2}}{\frac{h}{2}}$ $= \cos x \times \lim_{h/2 \rightarrow 0} \frac{\sin \frac{h}{2}}{\frac{h}{2}}$ $= \cos x \times 1$ $= \cos x.$	3 1 1 1	6

Qu. No	Scoring Indicators	Split Score	Total Score
14	(a) $\neg q \Rightarrow \neg p$ (b) Assume that $\sqrt{7}$ is rational then $\sqrt{7} = \frac{a}{b}$ where a & b have no common factors Squaring $7 = \frac{a^2}{b^2}$ $\Rightarrow a^2 = 7b^2$ — (1) $\Rightarrow 7$ divides a — (2) $\Rightarrow \exists$ an integer c such that $a = 7c$ then $a^2 = 49c^2$ and $a^2 = 7b^2$ from (1) $\Rightarrow 7b^2 = 49c^2$ $\Rightarrow b^2 = 7c^2$ $\Rightarrow 7$ divides b — (3) From (2) & (3) 7 divides both a & b, which is a contradiction. $\therefore \sqrt{7}$ is irrational.	1 1 1 1	4

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Qu. No	Scoring Indicators	Split Score	Total Score																																			
15	<table border="1"> <thead> <tr> <th>x_i</th> <th>f_i</th> <th>$f_i x_i$</th> <th>x_i^2</th> <th>$f_i x_i^2$</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>7</td> <td>21</td> <td>9</td> <td>63</td> </tr> <tr> <td>8</td> <td>10</td> <td>80</td> <td>64</td> <td>640</td> </tr> <tr> <td>13</td> <td>15</td> <td>195</td> <td>169</td> <td>2535</td> </tr> <tr> <td>18</td> <td>10</td> <td>180</td> <td>324</td> <td>3240</td> </tr> <tr> <td>23</td> <td>6</td> <td>138</td> <td>529</td> <td>3174</td> </tr> <tr> <td></td> <td>48</td> <td>614</td> <td></td> <td>9652</td> </tr> </tbody> </table> ① $\bar{x} = \frac{\sum f_i x_i}{N} = \frac{614}{48}$ $\approx \underline{\underline{12.79}}$ ② $\sigma = \frac{1}{N} \sqrt{N \sum f_i x_i^2 - (\sum f_i x_i)^2}$ $= \frac{1}{48} \sqrt{48 \times 9652 - (614)^2}$ $= \frac{1}{48} \sqrt{463296 - 376996}$ $= \frac{1}{48} \sqrt{86300} = \frac{293.77}{48} = \underline{\underline{6.12}}$	x_i	f_i	$f_i x_i$	x_i^2	$f_i x_i^2$	3	7	21	9	63	8	10	80	64	640	13	15	195	169	2535	18	10	180	324	3240	23	6	138	529	3174		48	614		9652	2	5
x_i	f_i	$f_i x_i$	x_i^2	$f_i x_i^2$																																		
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Qu. No	Scoring Indicators	Split Score	Total Score
16	(a) $P(A \cup B) = P(A) + P(B)$ $= \frac{3}{5} + \frac{1}{5}$ $= \frac{4}{5}$ (b) (i) $S = \{HHH, HHT, HTH, TTH, THT, THH, HTT, TTT\}$ Let E be the event (ii) 'At least two tails' $E = \{TTH, THT, HTT, TTT\}$ $P(E) = \frac{4}{8} = \frac{1}{2}$	1 1 1 1 1	5