

B
ENGLISH 5061
Special Schools.

SECOND YEAR HIGHER SECONDARY EXAMINATION, MARCH 2011



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
1		the patient at the dentist's clinic / the narrator of the poem, This ---- Bit	1	1
2.		sitting in a dentist's chair	1	1
3		physical, mental	1	1
4		it both physical and mental	1	1
5		i) Do not waste water ii) Should not waste water iii) Use water carefully any sensible words of advice	1 1	2
6.		which can bear weight lead who used to share their worries with him essential	1 1 1 1	4
7		Relevance of the traits recognized Comprehensiveness of the character sketch Appropriateness of the expressions used	1 2 1	4



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
8.		Comprehensiveness of the content Clarity of presentation Logical sequencing of the events Quality of language	2 2 1 1	6
9.		Organisation of ideas Proper communication of ideas Appropriateness of language	2 2 1	5
10		Organisation of ideas Clarity in presentation Quality of language	2 1 1	4
11		brought up made up	1 1	2
12		John Baldwin	1	1
13		Robert Baldwin	1	1
14.		John Gresham	1	1
15		appropriate explanation of the expression	2	2
16		Comprehensiveness of the character sketch appropriateness of the expressions used	2 2	4



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
17		relevance of the content Proper communication of ideas appropriateness of language	2 1 1	4
18		has been decided potrays an orphaned in the Auditorium	1 1 1 1	4
19		Content appropriateness of language Organisation of ideas and layout	2 1 1	4
20		Relevance of the content logical presentation clarity of presentation	2 1 1	4
21		Comprehensiveness of the content Organisation of data in appropriate format Communication Quality of language	3 1 2 2	8



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
22		Comprehensiveness of the content Relevance of the points clarity of presentation Logical sequencing of ideas	3 1 1 1	6
23		him, hadn't done	1 1	2
24		Comprehensiveness of the content Relevance of the points Organisation of ideas Expression of one's own view point Quality of language : :	3 1 1 1 2	8



5

5062

SECOND YEAR HIGHER SECONDARY EXAMINATION, MARCH 2017.

PART II MALAYALAM. (For the Hearing Impaired & Special Schools).

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
1.		ഭദ്രം.	1	1.
2.		നയിൻ ട്രാജഡി	1	1.
3		കീഴ്ജ്ഞ	1	1
4		എ. കൃഷ്ണൻ	1	1.
5		മലയാളം മനോരമ	1	1
6		നേരം - ചെറിയ - കെ. ചെറിയ	1	1
7		കിരകിര നാടികൾ - ചെറിയ	1	1
8		കിരകിര നാടികൾ - കിരകിര	1	1
9		എമ്മി കിരകിര - നാടികൾ	1	1
10		കിരകിര - കിരകിര	1	1



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
11		ഉത്തരമ്.	1	1
12		ബാലകൻ	1	1
13		(കുട)വാതം	1	1
14		വിദ്യകൻ	1	1
15		ശരി	1	1
16		ശരി	1	1
17		നന്നമു നാടകം തൂണു രാഗം വേളി താളം നിബദ്ധം	2 2	4
18		കുടിയൻ നിരീയ്ക്കുന്നു. പുണയൻ നിരീയ്ക്കുന്നു നൂറ്റാൾ പ്രകടിപ്പിക്കുന്നു.	1 1 2	4
19		കുടിയൻ നിരീയ്ക്കുന്നു. പുണയൻ നിരീയ്ക്കുന്നു.	2 2	4
20		ബാലകൻ അകത്തു നിൽക്കുന്നു. ബാലകൻ പ്രകടിപ്പിക്കുന്നു. അകത്തു നിൽക്കുന്നു.	1 2 1	4
21		അകത്തു നിൽക്കുന്നു. അകത്തു നിൽക്കുന്നു.	1 3	4
22		പുണയൻ നിരീയ്ക്കുന്നു. പുണയൻ നിരീയ്ക്കുന്നു.	1 3	4

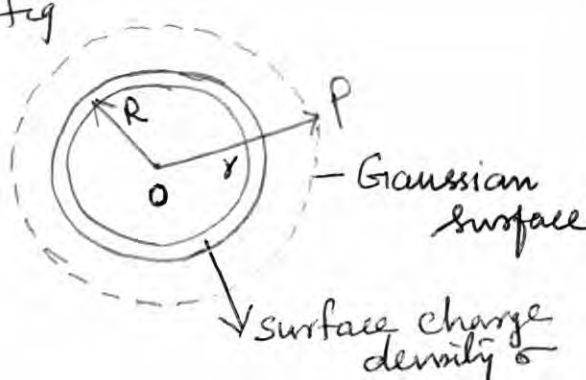
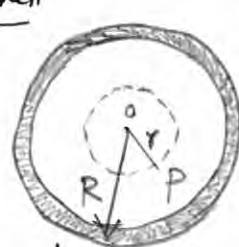


Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
24		മേൽകൂറു താങ്ങുന്ന ഗുരു ചികിത്സ കിരണം തിരുത്തലുള്ള കിരണം നല്ല ട്രിമിയിൽ അവതരിപ്പിച്ചിരിക്കുന്നു	1 3	(4)
25		പ്രകൃതി, ഭൂമി/അന്തർദ്വീപ് സംവിധാന രംഗം, സന്തോഷിപ്പിക്കുന്ന കിരണം തിരുത്തലുള്ള പ്രകൃതിയിലുള്ള ട്രിമി, പരമാവധി ഉൾക്കൊള്ളുന്നു	1 3 1	5
26		പ്രകൃതിയും കൃത്യമായ തിരുത്തലുള്ളതാണ് ഉപയോഗിക്കാൻ ഉപയോഗിക്കാൻ കഴിയുന്ന തിരുത്തലുള്ള കിരണം നല്ല ട്രിമിയിൽ വിശദീകരിക്കപ്പെടുന്നു	1 1 3	5
27		തെളിവു ലഭ്യമായ ചിത്രങ്ങൾ വേർതിരിച്ചു കാണിക്കാൻ കിരണം തിരുത്തലുള്ള നല്ല ട്രിമിയിൽ വിശദീകരിക്കപ്പെടുന്നു	2 3	5
28		ശ്രീപരമേശ്വരൻ വിജയലക്ഷ്മി ശ്രീമതി നാഗമ്മ തിരുത്തലുള്ള ശ്രീപരമേശ്വരൻ നല്ല ട്രിമിയിൽ വിശദീകരിക്കപ്പെടുന്നു	1 4	5
29		മുകളിലുള്ള ചിത്രങ്ങൾ തിരുത്തലുള്ള കിരണം തിരുത്തലുള്ള നല്ല ട്രിമിയിൽ വിശദീകരിക്കപ്പെടുന്നു	1 2 2	(5)
30	A)	മുകളിലുള്ള ചിത്രങ്ങൾ തിരുത്തലുള്ള നല്ല ട്രിമിയിൽ വിശദീകരിക്കപ്പെടുന്നു	2 2, 1, 2	8
	B)	നാടകങ്ങളിലെ നാടകങ്ങളിൽ വിശദീകരിക്കാൻ തിരുത്തലുള്ള ചിത്രങ്ങൾ, ട്രിമി, പരമാവധി ഉൾക്കൊള്ളുന്നു, തിരുത്തലുള്ള നല്ല ട്രിമിയിൽ വിശദീകരിക്കപ്പെടുന്നു	2 2, 1, 3	(8)
31	A)	തെളിവു ലഭ്യമായ ചിത്രങ്ങൾ തിരുത്തലുള്ള നല്ല ട്രിമിയിൽ വിശദീകരിക്കപ്പെടുന്നു	2 1 3 2	8
	B)	തെളിവു ലഭ്യമായ ചിത്രങ്ങൾ തിരുത്തലുള്ള നല്ല ട്രിമിയിൽ വിശദീകരിക്കപ്പെടുന്നു	1 3 2	8
		തെളിവു ലഭ്യമായ ചിത്രങ്ങൾ തിരുത്തലുള്ള നല്ല ട്രിമിയിൽ വിശദീകരിക്കപ്പെടുന്നു	4	(8)
Total.			80	80



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
I	(a) (b) (c)	False True The angle between the geometric meridian and the magnetic meridian is called declination	1 1 1	3
2.		A Repeater is a combination of a receiver and a transmitter. Its function is to pick up the signal from the transmitter, amplify and retransmits it to the receiver.	1 1	2
3.	(a) (b)	Radiowaves Infra red	1 1	2
4.	(a) (b)	The phenomenon in which electric current is generated by varying magnetic field is called electromagnetic induction. (iii) A.C. generator	2 1	3
5.		Statement of Gauss's law i) Field outside the shell	1	



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
		For the fig  Explanation of the figure Arriving upto $E \times 4\pi r^2 = \frac{\sigma}{\epsilon_0} 4\pi R^2$ ii) <u>Inside the shell</u> fig  Explanation of the figure Arriving upto $E \times 4\pi r^2 = 0$ $E = 0$ OR B. Definition of electric dipole	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1	5 OR

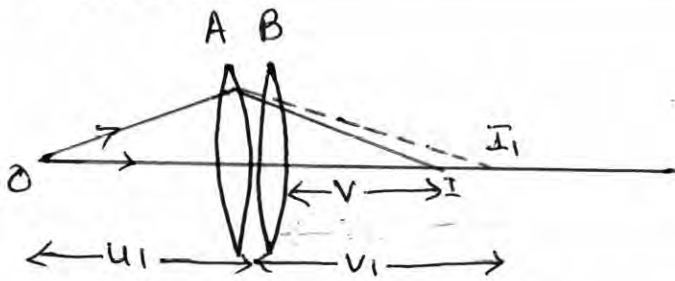


Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
		For the figure The magnitude of the electric fields due to the charges $+q$ and $-q$ are given by $E_{+q} = \frac{q}{4\pi\epsilon_0} \cdot \frac{1}{r^2 + a^2}$ $E_{-q} = \frac{q}{4\pi\epsilon_0} \cdot \frac{1}{r^2 + a^2}$ The total electric field is $E = -(E_{+q} + E_{-q}) \cos \theta$ $\therefore E = - \frac{2qa}{4\pi\epsilon_0 (r^2 + a^2)^{3/2}}$ At very large distances $r \gg a$ $E = - \frac{2qa}{4\pi\epsilon_0 r^3}$	1 $\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$	5



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
6.	(a)	Yellow - 4 Violet - 7 Red - 10^2 Gold - Tolerance value 5% $= (47 \times 10^2) \text{ ohms}$	$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{2} + \frac{1}{2}$	
	(b)	Statement of Junction rule At any junction the sum of the currents entering the junction is equal to the sum of the currents leaving the junction	1	
	(c)	In the case of a balanced bridge the resistors are such that $I_g = 0$ Applying Kirchhoff's law to the junction D & B, $I_1 = I_3 + I_2 = I_4$ For the 1st loop ADBA $-IR_1 + 0 + I_2 R_2 = 0 \quad \text{--- (1)}$ For the 2nd closed loop CBDC $I_2 R_4 + 0 - I R_3 = 0 \quad \text{--- (2)}$ From equ: (1) $\frac{I_1}{I_2} = \frac{R_2}{R_1}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{4}$	



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
		From eqn. 2 $\frac{I_1}{I_2} = \frac{R_4}{R_3}$ Hence $\frac{R_1}{R_2} = \frac{R_4}{R_3} \quad \text{---(3)}$ Eqn: (3) relating the four resistors represent the balanced condition.	$\frac{1}{4}$ $\frac{1}{2}$ 6	
7.		$\omega = f = \frac{1}{2\pi\sqrt{LC}}$ $= \frac{1}{2\pi\sqrt{25.48 \times 10^{-3} \times 796 \times 10^{-6}}}$ $= 35.4 \text{ Hz}$	1 $\frac{1}{2}$ $1 + \frac{1}{2}$ ($\frac{1}{2}$ mark for unit) 3	
8.	(a)	Definition  Explanation of the formation of the final image For the image formed by the first lens A, $\frac{1}{v_1} - \frac{1}{u} = \frac{1}{f_1} \quad \text{---(1)}$	2. 1 1 $\frac{1}{2}$	



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
		For the image formed by the second lens B, $\frac{1}{v} - \frac{1}{v_1} = \frac{1}{f_2} \quad \text{--- (2)}$ Adding 1 & 2 $\frac{1}{v} - \frac{1}{u} = \frac{1}{f_1} + \frac{1}{f_2}$ For a single lens of equivalent focal length f $\frac{1}{v} - \frac{1}{u} = \frac{1}{f} \therefore \frac{1}{f} = \frac{1}{f_1} + \frac{1}{f_2}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1	7
		OR Explaining the figure $\angle A + \angle QNR = 180^\circ \quad \text{--- (1)}$ From $\triangle QNR$ $\gamma_1 + \gamma_2 + \angle QNR = 180^\circ \quad \text{--- (2)}$ Comparing (1) & (2) $\gamma_1 + \gamma_2 = A$ S, angle of deviation $= (i - \gamma_1) + (e - \gamma_2)$	1 $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
		$i \text{ e } S = i - e - A$ <i>i-d curve</i>  Plotting i on the x -axis Plotting S on the y -axis Correct shape of the curve	$\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{2}$	
9.	(a) (b) (c)	Statement of the law The energy released in a nuclear reaction is called the Q value of the reaction. Graphite	1 1 1	3
10.	(a) (b) (c)	The force acting on a moving electric charge q due to both electric field and the magnetic field is called the Lorentz force. $F = q(\mathbf{v} \times \mathbf{B} + E)$ i) Lorentz force depends on the charge of the particle, the velocity and the magnetic field. $\therefore \text{Cyclotron Frequency} = \nu = \frac{Bq}{2\pi m}$	1 1 1 1	

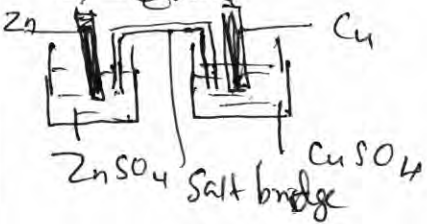


Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
		Explaining the letters B & m	$\frac{1}{4} + \frac{1}{4}$	5
11.	(a)	Drawing the energy level diagram showing correct transition $n_i = 2, 3, 4 \dots$ to $n_f = 1$	1 1	4
	(b)	$\lambda = R \left(\frac{1}{n_f^2} - \frac{1}{n_i^2} \right)$ 2) for Lyman series $\lambda = R \left(1 - \frac{1}{n_i^2} \right)$ where $n_i = 2, 3, 4 \dots$	1 1	
	(c)	Writing any one limitations	1	
12.		$\lambda = \frac{1.227}{\sqrt{V}}$ $\therefore \lambda = \frac{1.227}{\sqrt{100}}$ $= 0.123 \text{ nm}$ ($\frac{1}{2}$ marks for unit)	1 $\frac{1}{2}$ $1 + \frac{1}{2}$	3
13.	(a)	A Surface which has same electrostatic potential at every point on it is known as equipotential surface. 	1 1	3
	(b)	(iii) $\frac{1}{2} Q^2 / \epsilon$	1	

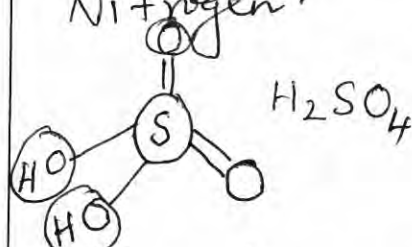


Qn. No	Sub Qns	Answer Key/Value Points	Score	Total																		
14.	(a)	When light is emitted from a source, then the particles present around it begins to vibrate. The locus of all such particles which are vibrating in the same phase is termed as a wavefront.	1	5																		
	(b)	i) Spherical	1																			
		ii) Plane	1																			
	(c)	$n = \tan i_B$	1																			
		$\therefore i_B = \tan^{-1}(1.5)$	$\frac{1}{2}$																			
		=	$\frac{1}{2}$																			
15.	a)	Transistor - Switch	1	6																		
		Zener diode - Voltage regulator	1																			
		Solar cells - Used in satellites and space vehicles	1																			
	(b)	Oscillators	1																			
	(c)	NAND gate	1																			
		<table><tr><th colspan="2">Input</th><th>Output</th></tr><tr><th>A</th><th>B</th><th>Y</th></tr><tr><td>0</td><td>0</td><td>1</td></tr><tr><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td></tr></table>	Input		Output	A	B	Y	0	0	1	0	1	1	1	0	1	1	1	0	$\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$ $\frac{1}{4}$	
Input		Output																				
A	B	Y																				
0	0	1																				
0	1	1																				
1	0	1																				
1	1	0																				



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
1.	a)	crystalline - Sodium chloride, quartz amorphous - glass, rubber	$\left. \begin{matrix} 1 \\ 1 \end{matrix} \right\} 2$	4
	b.	Any one defect - Schottky, or Frenkel Or any other defect - Naming - Explanation -	$\left. \begin{matrix} 1/2 \\ 1/2 \end{matrix} \right\} 2$	
2.	a)	Colligative property - definition	1	4
	b.	Relative lowering of vapour pr, depression in freezing pt or elevation in B.pt - any 2.	$1/2 \times 2 = 1$	
	c.	Pressure measurement is around the room temp and the molarity is used instead of <u>moleality</u>	1+1	
3.	a.	CH_3COOH	1	4
	b.		2+1	
4.	(i)	S^{-1} Any 2 differences Any one example - $2\text{H}_2 \rightarrow \text{H}_2 + \text{I}_2$	$\begin{matrix} 1 \\ 1+1 \\ 1 \end{matrix}$	4

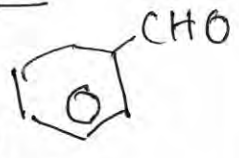


Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
5.	a.	butter	1	3
	b.	Write any one property Explanation	1/2 1/2 + 1/2 + 1/2	
6.	a.	Zinc blende	1	3
	b.	Explanation — or diagrammatic representation	2	
7.	a)	Nitrogen.	1	5
	b.		1	
		Contact process — explanation	2	
		Any one chemical properties OR	1	
	b.	Cl ₂ — prepared by heating MnO ₂ with HCl or action of HCl on KMnO ₄ or other relevant methods OR equations. Any 2 chemical properties Any 2 uses	1 1 x 2 1/2 x 2 = 1	



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
8.	a.	Any 4 p. $(n-1)d^{1-10} ns^{1-2}$	1	4
	b.	Any 3 characteristic properties	1x3	
9.	9) (i)	Pentaammine Bromo Cobalt(III) Sulphate	1	4
	(ii)	Pentaammine Sulphato Cobalt(III) bromide	1	
	b)	Ionisation Isomerism	1/2	
		Explanation -	1/2	
10	(a)	$CHCl_3$	1	4
	b.	Any one example for nucleophilic and electrophilic reaction.	1	
		Chemical equation	$\frac{1}{2} + \frac{1}{2}$	
11.	a.	$RMgX$	1	4
	b.	Due to intermolecular hydrogen bonding	1	
	c)	One reaction of Alcohol " " phenol	1 1	



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
12.	a.	$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C} \\ \\ \text{OH} \end{array}$	1	5
	b. (i)	Esterification : Alcohol + Carboxylic acids in presence of mineral acids Ore equation	1	
	(ii)	Cannizzaro reaction :- Aldehyde with no α -hydrogen atom, undergo self oxidation and reduction (disproportionation) reaction on heating with con. alkali. An aldehyde is reduced to alcohol and one molecule oxidised to carboxylic acid salt or Chemical equation	1	
	(iii)	Gatterman - Koch reaction Benzene $\xrightarrow[\text{Anhyd. AlCl}_3/\text{CuCl}]{\text{CO, HCl}}$ 	1	
	IV	On warming an aldehyde with freshly prepared ammoniacal silver nitrate solution, a bright silver mirror is produced due to the formation of silver metal. Ore equation	1	



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
13.	q)	Any one method of preparation Any 2 chemical reactions	1 1+1	3
14.		Mono saccharide - glucose Di saccharide - Sucrose Poly saccharide - Cellulose	1 1 1	3
15		Elastomer - Buna-S, neoprene Fibre - Nylon 6,6, terylene Thermoplastic - Polyethene Polyvinyl chloride	1 3 1	3
16	q)	Tranquilizers - class of chemicals used for treatment of stress, mild or even severe disorders. — Example - morphine or other Analgesics - abolish or reduce pain without causing impairment of consciousness, mental confusion — E.g. aspirin or other	1/2 1/2	3



SECOND YEAR HIGHER SECONDARY EXAMINATION, MARCH 2017.

Mathematics (5065)
(Special schools)

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
(1)	(a)	$\frac{\pi}{2}$	1	1
	(b)	$\tan^{-1} \left[\frac{\frac{1}{2} + \frac{2}{11}}{1 - \frac{1}{2} \times \frac{2}{11}} \right]$ $= \tan^{-1} \left(\frac{3}{4} \right)$	1 1	2
(2)	(a)	many one into	1	1
	(b)	$f \left[\frac{4x+3}{6x-4} \right]$ $= \frac{4 \left(\frac{4x+3}{6x-4} \right) + 3}{6 \left(\frac{4x+3}{6x-4} \right) - 4}$ $= x$ $f^{-1} = f$	1 1 1	4
(3)	(a)	To write A' , B'	1	1
	(b)	To find $A+B$ To find $(A+B)'$ To find $A'+B'$	1 1 1	3
	(c)	To find $A+A'$ To prove $(A+A')' = A+A'$	1 1	2



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
(4)	(a)	$\lim_{x \rightarrow 3^-} f(x) = \lim_{x \rightarrow 3} (ax+1) = 3a+1$ $\lim_{x \rightarrow 3^+} f(x) = \lim_{x \rightarrow 3} (2x+3) = 9$ $3a+1=9 \Rightarrow a = \frac{8}{3}$	1 1	2
	(b)	$a^x \cdot \log a$	1	1
	(c)	$\frac{dx}{dt} = 4, \frac{dy}{dt} = -\frac{4}{t^2}$ To find $\frac{dy}{dx}$	1 1	2
(5)	(a)	To find A^2	1	1
	(b)	To find $2A, 3I$ To find $A^2 - 2A + 3I$	1+1 1	2 3
(6)	(a)	$2-0=2$	1	1
	(b)	To find $2A$ and $ 2A $ To find $ A $ and $H(A)$	1 1	2
	(c)	$\begin{vmatrix} 1 & a & a^2 \\ 0 & b-a & b^2-a^2 \\ 0 & c-a & c^2-a^2 \end{vmatrix}$ $= (b-a)(c-a)(b+c+a)$	1 1	2

$$= (a-b)(b-c)(c-a)$$

1 3



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
(7)	(a)	$\log x = u \quad ; \quad \frac{1}{x} dx = du$	1	2
		$\int u^2 du = \frac{u^3}{3} + C$ $= \frac{(\log x)^3}{3} + C$	1	
	(b)	$\frac{1}{2} \int [\sin 6x + \sin 2x] dx$	1+1	3
		$\frac{1}{2} \left[-\frac{\cos 6x}{6} + -\frac{\cos 2x}{2} \right] + C$	1	
	(a)	<u>OR</u> $\frac{1}{2} \tan^{-1} \frac{x}{2} \Big _0^1$	1	2
		$= \frac{1}{2} \tan^{-1} 1 - \frac{1}{2} \tan^{-1} 0 = \frac{\pi}{4}$	1	
	(b)	$\int_0^1 (1-x) x^{10} dx$	1	3
		$\int_0^1 (x^{10} - x^{11}) dx$	1	
		$\left[\frac{x^{10}}{10} - \frac{x^{11}}{11} \right]_0^1 = \frac{1}{110}$	1	
(8)		Area $x^4 = x \Rightarrow x=0, 1$	1	4
		Area = $\int_0^1 (x^2 - \sqrt{x}) dx$	1	
		$= \left[\frac{x^3}{3} - \frac{2x^{3/2}}{3} \right]_0^1$	1	
		$= \frac{1}{3} - \frac{2}{3}$	1	

$$= \frac{1}{3} \text{ sq. units}$$



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
(9)		$A = \begin{bmatrix} 2 & 5 \\ 3 & 2 \end{bmatrix}; X = \begin{bmatrix} x \\ y \end{bmatrix}; B = \begin{bmatrix} 1 \\ 7 \end{bmatrix}$ $ A = -11$ $A^{-1} = -\frac{1}{11} \begin{bmatrix} 2 & -5 \\ -3 & 2 \end{bmatrix}$ $X = A^{-1} B = \begin{bmatrix} 3 \\ -1 \end{bmatrix}$ $x = 3, y = -1.$	1 1 1 1	4
(10)	a)	$P = \frac{2}{x}, Q = x.$	1 1	1 1
	b)	$IF = e^{\int \frac{2}{x} dx} = e^{2 \log x} = x^2$	1	1 1
	c)	$y \cdot x^2 = \int x - x^2 dx + c$ $y x^2 = \frac{x^4}{4} + c.$ $y = \frac{x^2}{2} + C x^{-2}$	1 1 1	2
(11)	(a)	$\sqrt{1^2 + 1^2 + (-2)^2} = \sqrt{6}$	1	1
	(b)	$\frac{\vec{a}}{\sqrt{6}}$	1+1	2
	(c)	$\vec{s} \times \frac{\vec{a}}{\sqrt{6}}$	1+1	2
(12)	(a)	$1 \times 3 + -2 \times 2 + 3 \times -3 = 3 - 4 - 9$	1+1 1+1	1+1 2
	(b)	$\cos \theta \frac{ \vec{a} \cdot \vec{b} }{\sqrt{14} \cdot \sqrt{22}}$ $= \frac{-10}{\sqrt{14} \cdot \sqrt{22}}$	1+1	2

Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
13)	(a)	$\vec{a} \times \vec{b} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1 & -7 & 0 \\ 3 & 2 & 2 \end{vmatrix}$ $= -14\hat{i} + 2\hat{j} + 23\hat{k}$	1	2
	(b)	$ \vec{a} \times \vec{b} $ $\text{Area} = \frac{1}{2} \vec{a} \times \vec{b} $	1	
	(a)	5	1	1
	(b)	$\begin{aligned} x + y &= 24 \\ y &= 24 - x \\ \therefore P &= x(24 - x) = 24x - x^2 \\ \frac{dP}{dx} &= 24 - 2x \\ \frac{dP}{dx} &= 0 \Rightarrow x = 12 \\ \frac{d^2P}{dx^2} &= -2 < 0, \text{ when } x = 12 \\ P &\text{ is maximum when } x = 12 \\ x &= 12, y = 12. \end{aligned}$	1	



Qn. No	Sub Qns	Answer Key/Value Points	Score	Total
(14)	a)	$l^2 + m^2 + n^2 = 1$	1	1
	b).	drs $0, 2, -1$ des $0, \frac{2}{\sqrt{3}}, -\frac{1}{\sqrt{3}}$	1	2
	c).	$\left. \begin{aligned} \vec{a} &= \hat{i} + 2\hat{j} + 3\hat{k} \\ \vec{b} &= \hat{i} + 4\hat{j} \\ \vec{b} - \vec{a} &= 2\hat{j} - 3\hat{k} \end{aligned} \right\}$	1	
		$\vec{r} = (\hat{i} + 2\hat{j} + 3\hat{k}) + \lambda(2\hat{j} - 3\hat{k})$	1	2
15)	a)	$6\hat{i} - 3\hat{j} + 2\hat{k}$	1	1
	b).	$d = \left \frac{6 \times 2 - 3 \times 5 + 2 \times -3 - 4}{\sqrt{6^2 + (-3)^2 + 2^2}} \right $	1	3
		$= \left \frac{12 - 15 - 6 - 4}{\sqrt{49}} \right $	1	
		$= \frac{13}{7}$	1	
		<u>OR</u>		
	a)	$3, 3, 3$ $3, 3, 3$	1	1
	b).	$\cos \theta = \left \frac{2 \times 2 + 2 \times -3 + -3 \times 5}{\sqrt{2^2 + 2^2 + (-3)^2} \sqrt{2^2 + (-3)^2 + 5^2}} \right $	1	3
		$= \left \frac{4 - 6 - 15}{\sqrt{17} \sqrt{38}} \right = \frac{17}{\sqrt{17} \sqrt{38}}$	1	
		$\theta = \cos^{-1} \left[\frac{17}{\sqrt{17} \sqrt{38}} \right]$	1	3

(16) (a) $13k = 1$
 $k = \frac{1}{13}$

(b) $2k = \frac{2}{13}$

(c) $1 - k - k = 1 - 2k$
 $= 1 - 2 \times \frac{1}{13} = \frac{11}{13}$

(d) $9k$
 $9 \times \frac{1}{13} = \frac{9}{13}$

/	1
/	1
/	
/	2
/	
/	2
/	
/	
/	
/	
/	
/	6

17) To draw the x, y axes

To draw the graph of $x + y = 50$

To draw the graph of $3x + y = 90$

To mark the feasible region

To find the corner points

Conclusion