



FEDERAL BOARD OF INTERMEDIATE
AND SECONDARY EDUCATION
H-8/4, ISLAMABAD




No.1-2/FBISE/RES/599

18 July, 2024

NOTIFICATION

In continuation to this office Notifications No.1-2/FBISE/RES/CC/391 dated 21 June 2023 the Model Question Paper for the subject of Mathematics at HSSC-II level as per Curriculum 2006 alongwith Table of Specifications (TOS) and Alignment Chart is prepared for the Annual Examinations 2025 only and uploaded on the weblink https://www.fbise.edu.pk/curriculum_model_paper.php. It is pertinent to mention here that with effect from Annual Examinations 2026 and onwards Paper of Mathematics HSSC-II will be assessed as per Curriculum 2022-23.


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Deputy Secretary
(Research & Academics)
Ph:051-9269539

Heads of all Institutions affiliated with FBISE
at HSSC level

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Federal Board HSSC-II Examination

Model Question Paper Mathematics

(Curriculum 2006)

Section - A (Marks 20)

Time Allowed: 25 minutes

Section – A is compulsory. All parts of this section are to be answered on this page and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

ROLL NUMBER					
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

Version No.			
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

Candidate Sign. _____

Invigilator Sign. _____

Q1. Fill the relevant bubble against each question. Each part carries one mark.

Sr no.	Question	A	B	C	D	A	B	C	D
i.	Which one of the following commands is used to draw a graph?	limit	iscont	det	plots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ii.	The range of the function $f(x) = x - 5 $ is:	$(-\infty, 0]$	$[0, +\infty)$	$[5, +\infty)$	$[-5, +\infty)$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iii.	What limit given in the following results $\frac{\sin(1-x)}{(1-x)} = 1$?	$x \rightarrow -1$	$x \rightarrow 0$	$x \rightarrow 1$	$x \rightarrow \infty$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iv.	What is the derivative of $\log_5 e^x$ w.r. t. x ?	$\frac{1}{x \log 5}$	$\frac{1}{x \ln 5}$	$x \log_5 e$	$x \ln e$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
v.	What is the value of $\sqrt{1-x^2} \frac{dy}{dx} (\sin^{-1} x + \cos^{-1} x)$?	2	0	$\sqrt{1-x^2}$	$\frac{1}{x}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
vi.	Which of the following represents $(y_2 + y)$, if $y = \cos x$?	$-y$	0	y	$2y$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
vii.	If $\vec{F}(t) = (t+5)\underline{i} + (2t^3)\underline{j} - (3t)\underline{k}$, then what is the evaluated value of $\lim_{t \rightarrow -2} \vec{F}(t)$?	$3\underline{i} + 8\underline{j} - 6\underline{k}$	$3\underline{i} - 16\underline{j} - 6\underline{k}$	$3\underline{i} - 16\underline{j} + 6\underline{k}$	$7\underline{i} + 16\underline{j} + 6\underline{k}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
viii.	For a velocity vector $\vec{v} = \cos(t)\underline{i} - 2\sin(t)\underline{j} + 3\underline{k}$, the acceleration vector \vec{a} is:	$\sin(t)\underline{i} + 2\cos(t)\underline{j} + 3\underline{k}$	$\sin(t)\underline{i} - 2\cos(t)\underline{j} + 3\underline{k}$	$-\sin(t)\underline{i} + 2\cos(t)\underline{j}$	$-\sin(t)\underline{i} - 2\cos(t)\underline{j}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ix.	For what value of k , the integral $\int_1^k x^{n-1} dx = \frac{1}{n}$? ; $n \in Z$	$\sqrt[n]{\frac{2}{n}}$	$\sqrt[n]{2}$	2^n	$\sqrt[n]{\frac{2n-1}{n}}$	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

x.	What is the evaluated value of $\int_0^{2\pi} \sin x \, dx$?	-2	0	2	4	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
xi.	For what values of x , the distance between the points (7,1) and (3, x) is 5?	4, -2	-4, 2	4, 2	-4, -2	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
xii.	The three lines defined by the equations $x + 2y = 0$, $2x + y = 0$, $3x + 5y = 0$ are:	sides of a triangle	Perpendicular	concurrent	parallel	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
xiii.	Which one of the following is an equation of a circle with center (3, -7) and goes through a point (1, 1)?	$(x + 3)^2 + (y - 7)^2 = 52$	$(x - 3)^2 + (y + 7)^2 = 68$	$(x - 3)^2 + (y + 7)^2 = 32$	$(x + 3)^2 + (y - 7)^2 = 40$	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
xiv.	What is the length of tangent drawn from an external point (-1, 2) to the circle $2x^2 + 2y^2 - 4x + 8y = 0$?	17	$\sqrt{3}$	5	$\sqrt{5}$	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
xv.	Which one of the following represents a parabola with focus (5, 0) and vertex (0, 0)?	$x^2 = 20y$	$x^2 = -20y$	$y^2 = -20x$	$y^2 = 20x$	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
xvi.	Equations of the asymptotes of a hyperbola $\frac{x^2}{7^2} - \frac{y^2}{4^2} = 1$ are:	$y = \pm \frac{4}{7}$	$y = \pm \frac{7}{4}$	$x = \pm \frac{4}{7}$	$x = \pm \frac{7}{4}$	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
xvii.	What is the order and degree of the differential equation $\frac{d^3y}{dx^3} - \sin^{-1} \left(\frac{d^2y}{dx^2} \right) = x^4 e^x$?	3, 4	3, 2	3, 1	3, not defined	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
xviii.	What is the solution of the differential equation $xdy - ydx = 0$?	$y = cx$	$y = ce^x$	$x - y = c$	$xy = c$	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
xix.	The MAPLE command to solve equation $3x^2 + 4x - 3 = 0$ is:	Simpson ($3x^2 + 4x - 3 = 0$)	<i>fsolve</i> ($3x^2 + 4x - 3 = 0$)	solve ($3x^2 + 4x - 3 = 0$)	<i>Psolve</i> ($3x^2 + 4x - 3 = 0$)	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
xx.	If $f(0) = 1$, $f(1) = 2.72$ then, what is the approximated value of $\int_0^1 f(x)dx$ by using the trapezoidal rule?	1.86	1.88	1.87	1.72	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>



Federal Board HSSC-II Examination

Model Question Paper Mathematics

(Curriculum 2006)

Time allowed: 2.35 hours

Total Marks: 80

Note: Answer all parts from Section 'B' and all questions from Section 'C' on the **E-sheet**.
Write your answers on the allotted/given spaces.

SECTION – B (Marks 48)

(12 × 4 = 48)

Q.2	Question	Marks		Question	Marks
i.	For an implicit function $x^2 + y^2 = 4$ a) Write 'Maple' command for plotting graph b) Plot graph manually. c) Write down domain and range.	4	OR	Find the equation of the following straight lines. a) Parallel to $x -$ axis and at a distance of 5 units below it. b) Perpendicular to $y -$ axis and passing through the point (6,4).	4
ii.	Find the area under the graph of $f(x) = x^3 - x$ over the interval $[-1, 1]$	4	OR	Determine the equation of the tangent to the curve defined by $y = 2x^2 - 7x + 1$ at $x = 2$.	4
iii.	Prove that $f(x, y) = x^3 - 3xy^2 + 5x^2y + 7y^3$ is a homogeneous equation of degree 3 and verify Euler's Theorem for f .	4	OR	Test the continuity of the function $f(x) = \begin{cases} 1 - 3x, & x < -6 \\ 7, & x = -6 \\ x^3, & x > -6 \end{cases}$ at $x = -6$	4
iv.	Solve the differential equation $\frac{dy}{dx} = 1 - xy + y - x$.	4	OR	Evaluate $\lim_{x \rightarrow 0} \frac{(1+x)^{-2} - 1}{x}$ and write its maple command.	4
v.	Compute four iterates of the bisection method for the function $f(x) = 2e^{-x} - 5 = 0$ for $[0, 1]$.	4	OR	Determine the 4 th derivative of $f(z) = 9\sin\left(\frac{z}{3}\right) + \cos(1 - 2z)$	4
vi.	For what value of k , line $x - y + k = 0$ will touch the circle $x^2 + y^2 = 81$. Also find tangent to the circle.	4	OR	Convert the equation $x^2 + 4y^2 + 2x - 24y + 33 = 0$ in standard form. Find the coordinates of the center, vertices, co-vertices and foci.	4
vii.	(a) By differentiating $x^2 - y^2 = 1$ implicitly, show that $\frac{dy}{dx} = \frac{x}{y}$ (b) Show that $\left(\frac{dy}{du}\right)_{u=0} = 0$, if $y = 3\sin 2x$ and $x = u^2 + \pi$	4	OR	A person on a hang glider is spiraling upward due to rapidly rising air on a path having position vector $\vec{r}(t) = (3\cos t)\underline{i} + (3\sin t)\underline{j} + (t^2)\underline{k}$. Find velocity and acceleration vectors.	4
viii.	Find values of $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ for the function $f(x, y) = \sqrt{y^2 - \ln(9y + 3x^2)}$	4	OR	Find the derivative of $\sin^{-1}\left(\frac{2x}{1+x^2}\right)$ w.r. t. $\tan^{-1} x$.	4
ix.	Evaluate $\int \frac{dx}{x^2 - 1}$	4	OR	If $\vec{F}(t) = e^t \tan(t)\underline{i} - \sqrt{\pi} \sec(t)\underline{j} + 2t\underline{k}$, then (a) Evaluate $\vec{F}(0)$, $\vec{F}\left(\frac{\pi}{2}\right)$ and $\vec{F}\left(\frac{2\pi}{3}\right)$	4

				(b) State domain of the function \vec{F} .	
x.	Find partial derivatives f_x and f_y of the function $f(x, y) = x^2e^{xy} + \ln(x + y)$	4	OR	Find all the points on curve $y = 2x^3 + 4x^2$ where tangent line is parallel to the line $y = 8x - 4$.	4
xi.	Find whether $f(x) = (x^4 - 4x + 2)^5$ shows relative maximum, relative minimum or neither at critical value $x = 1$.	4	OR	Evaluate $\int xe^{-x} dx$	4
xii.	Use the Newton-Raphson iterative method to approximate the actual root $r = 0.438447$ of the non-linear equation $f(x) = x^2 - 5x + 2$ with initial start $x_0 = 0.4$ that must be accurate to six decimal places.	4	OR	Anwar is driving a car with uniform speed $x + xt$, find: (i) Distance as a function of 't' (ii) Constant when $x(0) = 2$	4

SECTION – C (Marks 32)

(4 × 8 = 32)

Note: Attempt all questions. Marks of each question are given.

Q. No.	Question	Marks	Question	Marks
Q3	A curve has an equation $y = \frac{1}{2}x^3 - 9x^{1.5} + \frac{8}{x} + 30, x > 0$ (a) Find $\frac{dy}{dx}$ (b) Show that a point $(4, -8)$ lies on the curve defined. (c) Find equations of the tangent and normal at $(4, -8)$ giving your answer in the form $ax + by + c = 0 \quad \forall a, b, c \in R$	8	If $\vec{F}(t) = \underline{i} + 2e^{2t}\underline{j} + t^3\underline{k}$ and $\vec{G}(t) = 3t^2\underline{i} + 5e^{-t}\underline{j} - t3\underline{k}$ are the vector functions then evaluate a) $\frac{d}{dt}(\vec{F} \times \vec{G})(t)$ b) $\frac{d\vec{F}}{dt} \times \vec{G}$ c) $\vec{F} \times \frac{d\vec{G}}{dt}$ and verify d) $\frac{d}{dt}(\vec{F} \times \vec{G})(t) = \frac{d\vec{F}}{dt} \times \vec{G} + \vec{F} \times \frac{d\vec{G}}{dt}$	8
Q4	(a) $A(5,1), B(3, -5)$ and $C(-3,7)$ are the vertices of triangle ABC. Find equations of medians of triangle ABC. (b) Show that medians of triangle ABC are concurrent.	8	(a) If $A(-2,5), B(1,5)$ are end points of chord AB of circle $x^2 + y^2 + x - 5y - 2 = 0$, then show that line drawn from the center of circle is perpendicular to chord AB, and bisects chord AB. (b) Coordinates of end points of two chords are $P(0,2), Q(-2,0)$ and $R(0, -2), S(2,0)$. Show that the two chords PQ and RS are equidistant from the center of circle $x^2 + y^2 = 4$.	8
Q5	Evaluate $\int(\theta^4 + \pi)e^{3\theta} d\theta$	8	OR Solve the differential equation $y^2 dx + (xy + x^2) dy = 0$	8
Q6	If $u = \sec^{-1} \left[\frac{x-y}{\sqrt{\frac{x^2}{3} + \frac{y^2}{3}}} \right]^{\frac{1}{7}}$, then Show that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \frac{1}{28} \cot u$	8	OR Approximate the definite integral $I = \int_0^1 \sqrt{1-x^2} dx$ for $n = 4$ subintervals by using Simpson's Rule and then compare your approximate answer with the actual value of the definite integral.	8

Federal Board HSSC-II Examination
Mathematics Model Question Paper

(Curriculum 2006)

Alignment of Questions with Student Learning Outcomes

OBJECTIVE PART
SECTION A

Q. No. (Part no.)	Content Area/ Domain	Student Learning Outcomes	Cognitive Level *	Allocated Marks
Q1(i)	Domain: Algebra	[1.1]: (ii) Recognize basic MAPLE commands	K	1
Q1(ii)	Domain: Algebra	[2.1]: (ii) Draw the graph of modulus function ($y = x $) and identify its domain and range.	U	1
Q1(iii)	Domain: Algebra	[2.7]: (ii) Evaluate limits of different algebraic, exponential and trigonometric functions.	U	1
Q1(iv)	Domain: Algebra	[3.6]: (ii) Find the derivative of $\ln x$ and $\log_a x$ from first principles.	U	1
Q1(v)	Domain: Algebra	[3.5]: Inverse trigonometric functions ($\arcsin x$, $\arccos x$, $\arctan x$, $\operatorname{arccsc} x$, $\operatorname{arcsec} x$ and $\operatorname{arccot} x$) using differentiation formulae.	K	1
Q1(vi)	Domain: Algebra	[4.1]: (i) Find higher order derivatives of algebraic, trigonometric, exponential and logarithmic functions.	U	1
Q1(vii)	Domain: Algebra	[5.2]: (i) The limit of the sum (difference) of two vector functions is the sum (difference) of their limits. The limit of the product of a scalar function and a vector function is the product of their limits	K	1
Q1(viii)	Domain: Geometry	[5.4]: (ii) Apply vector differentiation to calculate velocity and acceleration of a position vector $\vec{r}(t) = x(t)\underline{i} + y(t)\underline{j} + z(t)\underline{k}$.	A	1
Q1(ix)	Domain: Algebra	[6.6]: (iii) Extend techniques of integration using properties to evaluate definite integrals.	U	1
Q1(x)	Domain: Algebra	[6.6]: (v) Apply definite integrals to calculate area under the curve.	A	1
Q1(xi)	Domain: Geometry	[7.1]: (i) Recall distance formula to calculate distance between two points given in Cartesian plane.	K	1
Q1(xii)	Domain: Geometry	[7.7]: (i) Find the condition of concurrency of three straight lines.	U	1
Q1(xiii)	Domain: Geometry	[8.2]: (i) Define circle and derive its equation in standard form i.e. $(x - h)^2 + (y - k)^2 = r^2$	U	1
Q1(xiv)	Domain: Geometry	[8.3]: (v) Find the length of tangent to a circle from a given external point.	K	1
Q1(xv)	Domain: Geometry	[9.1]: (iv) Find the equation of a parabola with the following given elements: • focus and vertex,	U	1

Q1(xvi)	Domain: Geometry	[9.3]: (iv) Convert a given equation to the standard form of equation of a hyperbola, find its elements and sketch the graph.	U	1
Q1(xvii)	Domain: Algebra	[10.1]: Define ordinary differential equation (DE), order of a DE, degree of a DE, solution of a DE.	K	1
Q1(xviii)	Domain: Algebra	[10.3]: (i) Solve differential equations of first order and first degree of the form:	U	1
Q1(xix)	Domain: Algebra	[12.1]: (iv) Use MAPLE command <i>fsolve</i> to find numerical solution of an equation and demonstrate through examples.	U	1
Q1(xx)	Domain: Algebra	[12.2]: (ii) Use MAPLE command <i>trapezoid</i> for trapezoidal rule and <i>simpson</i> for Simpson's rule.	A	1

SUBJECTIVE PART
SECTION B & C

Q. No. (Part no.)	Content Area/ Domain	Description of Student Learning Outcomes	Cognitive Level *	OR	Content Area/ Domain	Description of Student Learning Outcomes	Cognitive Level *	Allocated Marks
Q2(i)	Domain: Algebra	[1.3]: (i) Plot a two-dimensional graph.	U	OR	Domain : Geometry	[7.3]: Find the equation of a straight line parallel to • $y - axis$ and at a distance a from it, • $x - axis$ and at a distance b from it.	U	4
Q2(ii)	Domain: Algebra	[6.6]: (v) Apply definite integrals to calculate area under the curve.	A	OR	Domain : Geometry	[9.1]: (vii) Find the equation of a tangent and a normal to a parabola at a point	U	4
Q2(iii)	Domain: Algebra	[11.2]: (iii) Verify Euler's theorem for homogeneous functions of different degrees (simple cases).	U	OR	Domain : Algebra	[2.8]: (iii) Test continuity and discontinuity of a function at a point and in an interval.	U	4
Q2(iv)	Domain: Algebra	[10.3]: (i) Solve differential equations of first order and first degree of the form: • separable variables	K	OR	Domain : Algebra	[2.7]: (i) Evaluate the limits of functions of the following type $\frac{(1+x)^n - 1}{x}$ when $x \rightarrow 0$	U	4
Q2(v)	Domain: Algebra	[12.1]: (iii) Calculate real roots of a non-linear equation in one variable by	A	OR	Domain : Algebra	[4.1]: (i) Find higher order derivatives of algebraic, trigonometric,	K	4

		• bisection method				exponential and logarithmic functions.		
Q2(vi)	Domain: Geometry	[8.3]: (ii) Find the condition when a line touches the circle.	U	OR	Domain : Geometry	[9.2]: (v) Convert a given equation to the standard form of equation of an ellipse, find its elements and draw the graph.	K	4
Q2(vii)	Domain: Algebra	[3.4]: (iv) Find derivative of implicit function. Prove that $\frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx}$ when $y = f(u)$ and $u = g(x)$.	U	OR	Domain : Geometry	[5.4]: (ii) Apply vector differentiation to calculate velocity and acceleration of a position vector $\vec{r}(t) = x(t)\underline{i} + y(t)\underline{j} + z(t)\underline{k}$	A	4
Q2(viii)	Domain: Algebra	[11.1]: (iii) Find partial derivatives of a function of two variables.	K	OR	Domain : Algebra	[3.4]: (i) Prove that $\frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx}$ when $y = f(u)$ and $u = g(x)$	U	4
Q2(ix)	Domain: Algebra	[6.5]: Use partial fractions to find $\int \frac{f(x)}{g(x)} dx$, where $f(x)$ and $g(x)$ are algebraic functions such that $g(x) \neq 0$.	U	OR	Domain : Geometry	[5.1]: (i) Define scalar and vector function. ii) Explain domain and range of a vector function.	U	4
Q2(x)	Domain: Algebra	[11.1]: (iii) Find partial derivatives of a function of two variables.	K	OR	Domain : Geometry	[8.3]: (ii) Find the condition when a line touches the circle.	K	4
Q2(xi)	Domain: Algebra	[4.4]: (iii) Examine a given function for extreme values.	U	OR	Domain : Algebra	[6.4]: (iii) Evaluate integrals using integration by parts.	U	4
Q2(xii)	Domain: Algebra	[12.1]: (iii) Calculate real roots of a non-linear equation in one variable by Newton-Raphson method.	U	OR	Domain : Algebra	[10.3] (ii) Solve real life problems related to differential equations.	A	4
Q3	Domain: Geometry	[4.3]: (ii) Find the equation of tangent and normal to the curve at a given point.	K	OR	Domain : Geometry	[5.4]: (ii) Apply vector differentiation to calculate velocity and acceleration of a position vector $\vec{r}(t) = x(t)\underline{i} + y(t)\underline{j} + z(t)\underline{k}$.	A	8

Q4	Domain: Geometry	[7.7]: (ii) Find the equation of median, altitude and right bisector of a triangle.	U	<i>OR</i>	Domain : Geometry	[8.4]: Prove analytically the following properties of a circle. Perpendicular from the center of a circle on a chord bisects the chord.	A	8
Q5	Domain: Algebra	[6.4]: (iii) Evaluate integrals using integration by parts.	U	<i>OR</i>	Domain : Algebra	[10.3]: (i) Solve differential equations of first order and first degree of the form: • homogeneous equations	K	8
Q6	Domain: Algebra	[11.2]: (iii) Verify Euler's theorem for homogeneous functions of different degrees (simple cases).	U	<i>OR</i>	Domain : Algebra	[12.2]: (i) Define numerical quadrature. Use Simpson's rule, to compute the approximate value of definite integrals without error terms.	K	8

*Cognitive Level

K: Knowledge

U: Understanding

A: Application

Table of Specification
Model Question Paper Mathematics – Grade XII (HSSC-II)
(Curriculum 2006)

Topics	1 INTRODUCTION TO SYMBOLIC PACKAGE: MAPLE	2 FUNCTIONS AND LIMITS	3 DIFFERENTIAL DIFFERENTIATION	4 HIGHER ORDER DERIVATIVES AND APPLICATIONS	5 DIFFERENTIATION OF VECTOR FUNCTIONS	6 INTEGRATION	7 PLANE ANALYTIC GEOMETRY – STRAIGHT LINE	8 CONICS – I	9 CONICS – II	10 DIFFERENTIAL EQUATIONS	11 PARTIAL DIFFERENTIATION	12 INTRODUCTION TO NUMERICAL METHODS	Total marks of each assessment objectives	Percentage of Cognitive Level
Knowledge	1i(1)		1v(1)	2v/s(4) 3/f(8)	1vii(1)		1xi(1)	1xiv(1) 2x/s(4)	2vi/s(4))	1xvii(1) 2iv/f(4) 5/s(8)	2viii/f(4) 2x/f(4)	6/s(8)	54	30%
Comprehension	2i/f(4)	1ii(1) 1iii(1) 2iii/s(4) 2iv/s(4)	1iv(1) 2vii/f(4) 2viii/s(4)	1vi(1) 2xi/f(4)	2ix/s(4)	1ix(1) 2ixf/(4) 2xi/s(4) 5/f(8)	1xii(1) 2i/s(4) 4/f(8)	1xiii(1) 2vi/f(4)	1xv(1) 2ii/s(4))	1xviii(1)	2iii/f(4) 6/f(8)	1xix(1) 2xii/f(4)	90	50%
Application					1viii(1) 2vii/s(4) 3/s(8)	1x(1) 2ii/f(4)		4/s(8)	1xvi(1)	2xii/s(4)		1xx(1) 2v/f(4)	36	20%
Total marks	5	10	10	17	18	22	14	18	10	18	20	18	180	100%

Key:

- 1, 2, 3 etc. stands for question numbers
- i, ii, iii etc. stands for part of question numbers
- (1), (2), (3) etc. stands for marks of question papers
- Question Number (part/ first choice) marks example: Q2 (i / f) 4
- Question Number (part/ second choice) marks example: Q2 (i / s) 4

Note:

- 1 This TOS does not reflect policy, but it is particular to this model question paper.
- 2 Proportionate / equitable representation of the content areas may be ensured.
- 3 The percentage of cognitive level is 20%, 50%, and 30% for knowledge, understanding, and application, respectively with $\pm 5\%$ variation.
- 4 While selecting alternative questions for SRQs and ERQs, it must be kept in mind that:
 - Difficulty levels of both questions should also be same
 - SLOs of both the alternative questions must be different