

POLICY GUIDELINES FOR MATHEMATICS PAPER

Paper Pattern and Distribution of Marks Mathematics & **General Mathematics SSC-I&II**

The question paper is organized into following three sections, namely: "Section A, B & C": Questions posed may be text based or derived/unseen but in similar pretext and difficulty level as per the lessons taught in the course. Distribution of the questions with respect to cognitive domain within each section shall roughly be around 30 percent Knowledge (K), 50 percent Understanding (U) and 20 percent Application (A).

The Questions in these subjects should be designed in such a manner that no pet-definitions are asked or required from the candidates to be reproduced. Moreover the questions should be appropriately designed whilst keeping in consideration the time for thought-process (particularly in U and A Cognitive Domain questions) and the length of the subsequent text to be produced by the candidates.

SECTION — A

This section consists of question number one with 15 compulsory structured part questions - Multiple Choice Questions (MCQs) of one mark each. These MCQs should preferably be designed in such a way that they cover the whole course taught. These MCQs should objectively test the understanding of the concepts of the candidates in these subjects.

SECTION — B

This section consists of question number two (02) with preferably 14 part questions – Short Response Questions (SRQs) of Four (04) marks each. The candidates are required to attempt (respond to) any Nine (09) SRQs for a maximum total of 36 marks in this section.

SECTION — C

This section consists of Five (05) Extended Response Question (ERQs) of 8 marks each. Candidates are required to attempt (respond to) any Three (03) of these ERQs as per their choice and convenience. These questions may comprise of two or more part questions each if deemed necessary by paper setter in order to balance out the distribution various concepts and knowledge areas from different Cognitive Domains taught in course. None of these part questions shall be of less than 04 marks.

Annexure for Policy Guidelines for Question Paper

Definitions and Disclaimer

Policy guidelines for paper setting vide Notification No.6-8/FBISE/RES/CC/918 dated 27 August 2019 have been conveyed for general information. Definitions of some terminologies and disclaimers are given in this annexure.

1. Definitions

I. Cognitive Domains

Cognitive domain refers to development of mental skill and acquisition of knowledge.

In the questions papers developed by Federal Board of Intermediate & Secondary Education, Islamabad from hereon will be intended to test the following cognitive domains of the candidates:

- Knowledge: Approximately 30% Question in each section
- Understanding: Approximately 50% Question in each section
- Application: Approximately 20% Question in each section

i. Knowledge (K)

Knowledge refers to the ability of the candidates to recall the learned or memorized information or data.

Examples

- A child reciting the alphabets of English
- Memorization and reproducing the dates and other facts etc.
e.g. Pakistan came into being on 27th Night of Ramadan-ul-Mubarak.

Related Verbs (Command Words)

Arrange, define, duplicate, label, list, memorize, name, order, recognize, relate, recall, repeat, reproduce, state etc.

ii. Understanding (U)

Understand (also called Comprehension) refers to ability of the candidates to comprehend (a set of) information and/or situation and provide his/her response to it accordingly.

Examples

- Performing analyses and illustrating the observations
- Comprehending the concepts of Social, Natural and Physical Sciences
e.g. Discuss different types of noise and their impact on human health briefly.

Related Verbs (Command Words)

Classify, describe, discuss, explain, express, identify, indicate, locate, recognize, report, restate, review, select, translate, rephrase, differentiate, compare etc.

iii. Application (A)

Application refers to the ability to use learned material in new and concrete situation to solve problems and/or to design a schedule or task.

Examples

- Performing analyses and illustrating the observations
- Comprehending the concepts of Social, Natural and Physical Sciences
e.g. Illustrate the similes and metaphors given in the poem Daffodils.

Related Verbs (Command Words)

Apply, choose, demonstrate, dramatize, employ, illustrate, interpret, operate, practice, schedule, sketch, solve, use, write etc.

II. Sections of Paper

There are three or four (03 or 04) sections in each question paper:

i. Section-A

Contains Multiple Choice Questions (MCQs). All questions are compulsory without any external or internal choice. Usually comprises of 20% of total marks of the (theory if applicable) paper.

ii. Section B

Contains Short Response Questions (SRQ). Candidates may have external choice up to 33%. In addition to that internal choice may also be offered based upon model, content and/or nature of the subject.

- This section may contain almost 50% of total marks in some subjects of the (theory if applicable) paper.

iii. Section C

This section usually contains Extended Response Questions (ERQ). Candidates may have external choice in the questions. In addition to that internal choice may also be offered based upon model, content and/or nature of the subject. For ERQs it should contain around 30% of total marks in some subjects of the (theory if applicable) paper.

III. Choice

Sometimes the candidates are required to attempt a certain number of questions from a given pool or group of questions, it is commonly known as choice in questions.

There are two types of choices

i. External Choice

Whenever the candidates are required to solve (respond to) a certain number of questions from a given pool it is called external choice. This choice may be around 33% in a section.

- e.g.
1. Answer any six parts in about 30-40 words each.
(Out of eight questions)
 2. Attempt any eight questions from the following.
(Out of eleven questions)

ii. Internal Choice

Whenever the candidates have to solve (respond to) a question mandatorily but they have an option within the question it is called internal choice.

- e.g.
1. Paraphrase any ONE of the following stanzas.
 - a. Stanza 1
 - b. Stanza 2
 2. Translate the following: (Some sentences for translation are given)

OR

Write a Dialogue between a beggar and a citizen

2. Disclaimers

- I. The cognitive levels written in sample model paper are for explanation purpose only. In the actual question papers administered during examination shall not contain description of these cognitive domains.
- II. Association of the cognitive domains is solely based on subject expert's judgment and may be subject to errors and/or omissions.
- III. In the class rooms and during teaching the candidates (students) need to be taught about the time management in accordance with allocation of marks to the questions.



Roll No:

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Answer Sheet No: _____

Sig. of Candidate: _____

Sig. of Invigilator: _____

**Federal Board SSC-II Examination
General Mathematics Model Question Paper**

SECTION – A

Time allowed: 20 minutes

Marks: 15

Note: Section-A is compulsory. All parts of this section are to be answered on the question paper itself. It should be completed in the first 20 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q.1 Encircle the correct option i.e. A / B / C / D. All parts carry equal marks.

- i. If $x = \sqrt{5} + 2$ then $\frac{1}{x} = ?$
- A. $\sqrt{5} - 2$ B. $-\sqrt{5} + 2$
C. $-\sqrt{5} - 2$ D. $5 - \sqrt{2}$
- ii. For what value of k , $x^2 + 4kx - 5$ is completely divisible by $x - 1$?
- A. $\frac{3}{2}$ B. 1
C. -1 D. $-\frac{3}{2}$
- iii. The LCM of $x^2 - a^2$ and $(x + a)^2$ is
- A. $(x - a)(x + a)$ B. $(x - a)(x + a)^3$
C. $(x - a)(x + a)^2$ D. $(x + a)^2$
- iv. The square root of $49x^2 + 112xy + 64y^2$ is
- A. $(7x + 8y)^2$ B. $(7x + 8y)$
C. $(7x - 8y)$ D. $\pm(7x + 8y)$
- v. What is the solution set of $\sqrt{x - 4} = -2$?
- A. $\{8\}$ B. $\{0\}$
C. $\{2\}$ D. $\{ \}$
- vi. The solution set of $|3x - 4| = |x|$ is:
- A. $\{2, 1\}$ B. $\{ \}$
C. $\{0\}$ D. $\{2\}$
- vii. What are the multiplicative factors of $(x - 3)^2 - 4$?
- A. $(x - 5)(x + 1)$ B. $(x + 5)(x - 1)$
C. $(x - 5)(x - 1)$ D. $(x + 5)(x + 1)$

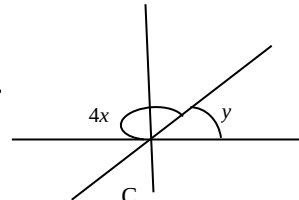
DO NOT WRITE ANYTHING HERE

viii. If A and B are square matrices, then which of the options is false?

- A. $(AB)^t = B^t A^t$ B. $(A-B)^t = A^t - B^t$
 C. $AB \neq BA$ D. $(kA)^t = k^t A^t$

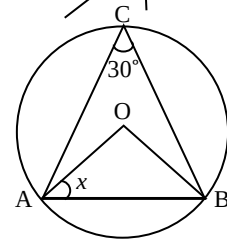
ix. What is the value of x in the figure when $y = 40^\circ$?

- A. 10° B. 12.5°
 C. 35° D. 45°



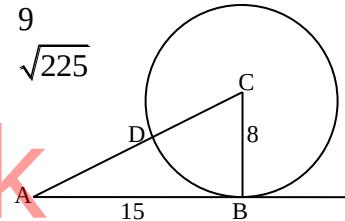
x. What is the value of x in the figure?

- A. 45° B. 60°
 C. 30° D. 40°



xi. What is the length of $\overline{AD}$ in the figure?

- A. 8 B. 9
 C. 17 D. $\sqrt{225}$



xii. Each side of an equilateral triangle is 10cm . The height of triangle is

- A. 5cm B. $5\sqrt{3}\text{cm}$
 C. $10\sqrt{2}\text{cm}$ D. $10\sqrt{3}\text{cm}$

xiii. The volume of a right circular cylinder having radius 2cm and height 7cm is

- A. 88cm^3 B. 29.3cm^3
 C. 33.5cm^3 D. 117.3cm^3

xiv. The perpendicular distance of the point $(-3, 4)$ from y -axis is

- A. 4 B. -3
 C. 3 D. 5

xv. For what value of x , distance between the points $A(4, x)$ and $B(1, 0)$ is 5 ?

- A. 0 B. ± 2
 C. ± 3 D. ± 4

For Examiner's use only:

Total Marks:

15

Marks Obtained:



Federal Board SSC-II Examination
General Mathematics Model Question Paper

Time allowed: 2.40 hours

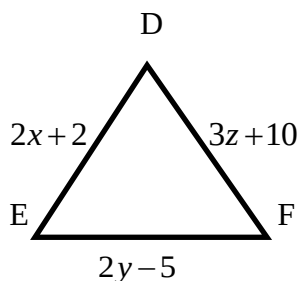
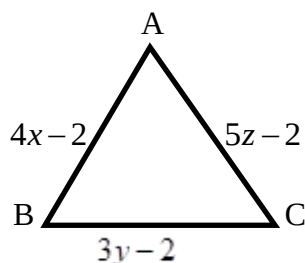
Total Marks: 60

Note: Attempt any nine parts from Section 'B' and any three questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet-B if required. Write your answers neatly and legibly. Log book and graph paper will be provided on demand.

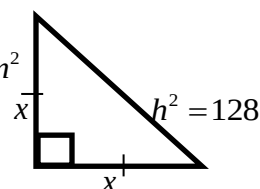
SECTION – B (Marks 36)

Q.2 Attempt any **NINE** parts from the following. All parts carry equal marks. ($9 \times 4 = 36$)

- i. Find the continued product of $64x^6 - 729y^6$
- ii. If $x = \sqrt{5} + 2$ then find the values of
 - a. $\frac{1}{x}$
 - b. $x + \frac{1}{x}$
 - c. $x - \frac{1}{x}$
 - d. $x^2 - \frac{1}{x^2}$
- iii. Factorize $4x^4 - 5x^2y^2 + y^4$
- iv. If $P(x) = 3x^3 + kx - 26$ is divisible by $(x - 2)$, then find the value of k , if remainder is zero.
- v. Find the HCF of $x^3 + 27$, $2x^2 - 5x - 3$, $x^2 - 2x - 15$
- vi. Find the square root of $36x^4 - 96x^3 + 76x^2 - 16x + 1$
- vii. Solve $\frac{1}{2}(3 + 4x) \leq 6\left(\frac{1}{3} - \frac{1}{2}x\right) - \frac{1}{4}(2 + 10x)$ and show the solution set on Number Line.
- viii. Solve $\sqrt{2}x^2 + 7\sqrt{2}x + 12\sqrt{2} = 0$ by using the quadratic formula.
- ix. If $A = \begin{bmatrix} 5 & 2 \\ 2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 2 \\ 3 & -1 \end{bmatrix}$ then find
 - (a) AB
 - (b) $|AB|$
 - (c) $adj(AB)$
 - (d) $(AB)^{-1}$
- x. If $\triangle ABC \cong \triangle DEF$ then find the values of x, y and z .



- xi. Draw a circle of radius $3cm$ with center at O . Draw a chord and shade the portion showing the major arc of the circle.
- xii. If square of the hypotenuse of an isosceles right triangle is $128cm^2$ then find the length x of each side.



- xiii. Calculate radius of a sphere of volume $850m^3$.
(xiv) Show that the points $A(-1,1)$, $B(3,2)$ and $C(7,3)$ are collinear.

SECTION – C (Marks 24)

Note: Attempt any **THREE** questions. Each question carries six marks. (3 × 8 = 24)

- Q.3 Simplify $\frac{x^2-1}{x^2+x-2} \times \frac{x^3+8}{x^4+4x^2+16} \div \frac{x^3+x}{x^3+2x^2+4x}$
- Q.4 The sum of two positive numbers is 12 and the sum of whose squares is 80. Find the numbers.
- Q.5 At a carry-out pizza restaurant, an order of 6 slice pizza and 2 juice drinks costs Rs. 360. A second order of 12 slice pizza and 5 juice drinks costs Rs. 750. Use Cramer's Rule to find the cost of a pizza slice and a juice drink.
- Q.6 In $\triangle ABC$, $\overline{mBC} = 5cm$, $m\angle B = 60^\circ$, $m\angle C = 30^\circ$
(a) Construct $\triangle ABC$
(b) Draw right bisectors to locate the mid points of the sides of $\triangle ABC$
(c) Draw the medians of $\triangle ABC$
- Q.7 The length and breadth of a rectangle are $(3x+2)cm$ and $(3x-2)cm$ respectively. Find
(a) the perimeter in terms of x
(b) the area in terms of x
(c) the value of x , if area of the rectangle is $77cm^2$
(d) the perimeter using x value.

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