



FCO ASSESSMENT FOUNDATION

Section 8 Non-Profit Organisation • FCO 2026-27 Scholarship Assessment

SAMPLE QUESTION PAPER — CLASS 12

Senior Advanced Level • Assessment Window: January 2027

Total Questions	100 (Multiple Choice)
Maximum Marks	100
Duration	90 minutes
Marking Scheme	1 mark per correct answer • No negative marking
Medium	English
Answer Key	Provided at the end of this paper

Paper Structure

Section	Area Assessed	Questions	Marks
Section A	Subject Knowledge	1 – 20	20
Section B	Reasoning & Mathematics	21 – 40	20
Section C	General Knowledge & Current Awareness	41 – 60	20
Section D	Future Skills, Technology & AI Awareness	61 – 100	40

General Instructions

1. All questions are compulsory. Each question carries one mark.
2. Each question has four options; exactly one option is correct.
3. Darken only one circle per question on the OMR sheet. Multiple marks will be treated as incorrect.
4. Use a blue or black ballpoint pen. Rough work may be done on the space provided in the booklet.
5. Calculators, mobile phones and smart devices are not permitted in the examination hall.
6. This is a sample paper for practice. The actual paper will follow the same structure and difficulty.

FCO is a year-long student development journey. Every registered learner receives a detailed skill report, personalised guidance and continuous support through the assessment year — not just a score.

Section A — Subject Knowledge

Questions 1 to 20 • 20 marks

1. The SI unit of electric flux is

- (A) newton per coulomb (B) weber
(C) volt (D) volt meter

2. Gauss's law relates electric flux through a closed surface to

- (A) the surface area (B) the electric field magnitude alone
(C) the enclosed charge (D) the potential difference

3. The capacitance of a parallel plate capacitor increases when

- (A) plate separation increases (B) plate area decreases
(C) dielectric constant of medium decreases (D) plate area increases

4. Kirchhoff's junction rule is based on conservation of

- (A) mass (B) energy
(C) momentum (D) charge

5. The force between two parallel current carrying wires in the same direction is

- (A) zero (B) always repulsive
(C) always attractive (D) depends on length only

6. A moving charge produces a magnetic field described by

- (A) Ohm's law (B) Coulomb's law
(C) Biot-Savart law (D) Faraday's law

7. Lenz's law is a consequence of conservation of

- (A) energy (B) charge
(C) momentum (D) mass

8. The phenomenon of self induction occurs in

- (A) a single coil due to change in its own current
(B) a resistor
(C) two separate coils only (D) a capacitor only

9. In an AC circuit containing only a capacitor, the current

- (A) is in phase with voltage (B) is zero
(C) leads the voltage by 90 degrees (D) lags the voltage by 90 degrees

10. The photoelectric effect could not be explained by

- (A) wave theory of light (B) Einstein's equation
(C) quantum theory (D) particle theory of light

11. The de Broglie wavelength of a particle is inversely proportional to its

- (A) energy squared (B) momentum
(C) mass (D) charge

12. In a nuclear reaction, the mass defect is converted into

- (A) potential energy of nucleus (B) zero
(C) binding energy released (D) kinetic energy of electrons only

13. A p-n junction diode conducts significantly when forward biased because

- (A) the depletion region narrows and majority carriers flow (B) electrons are repelled from the junction
(C) resistance becomes infinite (D) the depletion region widens

14. The rate law of a chemical reaction is determined by

- (A) experimental data (B) the balanced equation alone
(C) stoichiometric coefficients only (D) thermodynamic feasibility

15. A first order reaction has a rate constant with units of

- (A) per second (B) litre per mol per second
(C) mol squared per litre squared per second (D) mol per litre per second

16. Which functional group is present in aldehydes

- (A) hydroxyl (B) carbonyl attached to hydrogen and one carbon
(C) amine (D) carboxyl

17. The S_N1 reaction mechanism proceeds through

- (A) a carbanion intermediate
(B) a free radical chain intermediate
(C) a concerted single step
(D) a carbocation intermediate

18. Which of these is an example of a condensation polymer

- (A) nylon 6,6
(B) PVC
(C) polythene
(D) polystyrene

19. In genetics, a test cross is used to determine

- (A) the genotype of an organism showing dominant phenotype
(B) the number of chromosomes
(C) the mutation rate
(D) the phenotype of an organism

20. Restriction endonucleases are used in biotechnology to

- (A) translate mRNA
(B) replicate DNA
(C) join DNA fragments
(D) cut DNA at specific sequences

Section B — Reasoning & Mathematics

Questions 21 to 40 • 20 marks

21. If f of x equals x cubed minus $3x$, the derivative at x equals 2 is

- (A) 12
(B) 9
(C) 3
(D) 6

22. The value of the integral of 1 by x dx from 1 to e is

- (A) 0
(B) 1
(C) infinity
(D) e

23. Two events A and B are independent if

- (A) $P(A \text{ or } B)$ equals zero
(B) $P(A \text{ and } B)$ equals $P(A)$ times $P(B)$
(C) $P(A \text{ given } B)$ equals $P(B)$
(D) $P(A \text{ and } B)$ equals $P(A)$ plus $P(B)$

24. The number of ways to arrange the letters of the word LEVEL is

- (A) 30
(B) 60
(C) 20
(D) 120

25. If matrix A is a square matrix such that A squared equals A, A is called

- (A) orthogonal
(B) idempotent
(C) skew symmetric
(D) singular

26. The derivative of $\sin^{-1} x$ with respect to x is

- (A) $\frac{1}{1+x^2}$
(B) $\frac{1}{\sqrt{1-x^2}}$
(C) $-\frac{1}{\sqrt{1-x^2}}$
(D) $\cos x$

27. A line has direction ratios 1, 2, 2. Its direction cosines are obtained by dividing by

- (A) 4
(B) 3
(C) 5
(D) 9

28. The probability distribution of a random variable must have probabilities summing to

- (A) 0.5
(B) 100
(C) 0
(D) 1

29. The order of the differential equation $d^2y/dx^2 + dy/dx = x$ is

- (A) 1
(B) 2
(C) 0
(D) 3

30. If the mean of a binomial distribution is 4 and variance is 3, the value of n is

- (A) 12
(B) 20
(C) 8
(D) 16

31. For a linear programming problem, the optimal solution occurs at

- (A) any random point
(B) the origin always
(C) a corner point of the feasible region
(D) the centre of feasible region

32. The scalar triple product of coplanar vectors is

- (A) 1
(B) zero
(C) negative always
(D) undefined

33. Two matrices can be multiplied only if

- (A) they are both square
(B) they have the same order
(C) they are both symmetric
(D) number of columns of first equals number of rows of second

34. If A is invertible, then determinant of A inverse equals

- (A) 1 divided by determinant of A
(B) 0
(C) determinant of A
(D) 1

35. The general solution of dy/dx equals ky represents

- (A) linear growth
(B) exponential growth or decay
(C) quadratic growth
(D) constant function

36. A continuous random variable's probability at a single point is

- (A) 1
(B) 0
(C) 0.5
(D) undefined

37. The angle between two lines with direction ratios proportional and equal is

- (A) 90 degrees
(B) 0 degrees
(C) 180 degrees
(D) 45 degrees

38. In a Poisson distribution, mean and variance are

- (A) always different
(B) unrelated
(C) inversely related
(D) always equal

39. The rank of a null matrix is

- (A) undefined
(B) 0
(C) equal to its order
(D) 1

40. Which measure of central tendency is most affected by extreme values

- (A) mean
(B) mode
(C) none
(D) median

Section C — General Knowledge & Current Awareness

Questions 41 to 60 • 20 marks

41. India's central bank responsible for monetary policy is

- (A) NABARD
(B) SEBI
(C) NITI Aayog
(D) Reserve Bank of India

42. The Goods and Services Tax in India is an example of

- (A) progressive tax only
(B) wealth tax
(C) indirect tax
(D) direct tax

43. Which organisation publishes the annual Human Development Report

- (A) WTO
(B) WHO
(C) UNDP
(D) IMF

44. The current Chief Election Commissioner related body that conducts Indian elections is the

- (A) Election Commission of India
(B) Union Public Service Commission
(C) Law Commission
(D) Finance Commission

45. Fiscal deficit refers to

- (A) total revenue minus total expenditure
(B) tax revenue minus non tax revenue
(C) total expenditure minus total receipts excluding borrowings
(D) excess of imports over exports

46. The headquarters of the World Trade Organization is located in

- (A) Geneva
(B) Paris
(C) New York
(D) Vienna

47. India's space agency ISRO successfully landed Chandrayaan-3 near which lunar region

- (A) the far side centre
(B) the south pole region
(C) the equator
(D) the north pole region

48. The term repo rate refers to the rate at which

- (A) government borrows from World Bank
(B) banks lend to public
(C) banks lend to each other
(D) RBI lends to commercial banks

49. Which Indian ministry releases the Economic Survey before the Union Budget

- (A) Ministry of Commerce
(B) NITI Aayog
(C) RBI
(D) Ministry of Finance

50. The G20 summit in 2023 was hosted by

- (A) Brazil
(B) Italy
(C) Indonesia
(D) India

51. Which scheme aims at financial inclusion through zero balance bank accounts in India

- (A) Skill India
(B) Jan Dhan Yojana
(C) Ayushman Bharat
(D) Digital India

52. The Paris Agreement primarily deals with

- | | |
|-------------------------------|-------------------------|
| (A) climate change mitigation | (B) nuclear disarmament |
| (C) refugee rights | (D) trade tariffs |

53. Which index ranks countries based on ease of doing business

- | | |
|----------------------------------|----------------------------------|
| (A) Ease of Doing Business Index | (B) Global Hunger Index |
| (C) Human Development Index | (D) Corruption Perceptions Index |

54. The Reserve Bank of India's inflation target range under flexible inflation targeting is

- | | |
|--------------------|----------------------|
| (A) 2 to 6 percent | (B) 10 to 14 percent |
| (C) 0 to 2 percent | (D) 6 to 10 percent |

55. BRICS is an association originally comprising Brazil, Russia, India, China and

- | | |
|------------------|---------------|
| (A) Saudi Arabia | (B) Indonesia |
| (C) South Africa | (D) Mexico |

56. The Insolvency and Bankruptcy Code in India primarily addresses

- | | |
|----------------------------|--|
| (A) land acquisition | (B) corporate and individual insolvency resolution |
| (C) foreign trade disputes | (D) income tax disputes |

57. Which UN body is primarily responsible for international peace and security

- | | |
|------------|----------------------|
| (A) UNESCO | (B) Security Council |
| (C) ECOSOC | (D) UNICEF |

58. Which country currently holds the largest foreign exchange reserves in the world

- | | |
|-------------------|-----------|
| (A) China | (B) Japan |
| (C) United States | (D) India |

59. The term stagflation describes an economy with

- | | |
|--|--|
| (A) high growth and low inflation | (B) deflation and high growth |
| (C) low inflation and low unemployment | (D) high inflation and stagnant growth with unemployment |

60. Which Indian mission focuses on producing green hydrogen at scale

- | | |
|--------------------------|-------------------------------------|
| (A) Skill India Mission | (B) National Green Hydrogen Mission |
| (C) Smart Cities Mission | (D) Digital India Mission |

Section D — Future Skills, Technology & AI Awareness

Questions 61 to 100 • 40 marks

61. The World Economic Forum's annual meeting is held in

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|------------|------------|
| (A) Basel | (B) Davos |
| (C) Geneva | (D) Zurich |

62. A deep learning model composed primarily of self attention layers for sequence data is called a

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|----------------------------------|----------------------------|
| (A) decision tree | (B) transformer |
| (C) convolutional neural network | (D) support vector machine |

63. In machine learning, overfitting occurs when a model

- | | |
|---------------------------------------|--|
| (A) has too few parameters | (B) performs well on training data but poorly on unseen data |
| (C) generalizes very well to new data | (D) performs poorly on both training and test data |

64. The technique of randomly dropping neurons during training to reduce overfitting is called

- | | |
|-------------|-------------------------|
| (A) pooling | (B) gradient clipping |
| (C) dropout | (D) batch normalization |

65. Which metric balances precision and recall into a single score

- | | |
|---------------|------------------------|
| (A) F1 score | (B) mean squared error |
| (C) R squared | (D) accuracy |

66. In neural networks, backpropagation is used to

- | | |
|---------------------------------|--|
| (A) initialize weights randomly | (B) select hyperparameters |
| (C) normalize input data | (D) compute gradients and update weights |

67. Generative Adversarial Networks consist of a generator and a

- | | |
|------------------|-------------------|
| (A) encoder only | (B) classifier |
| (C) regressor | (D) discriminator |

68. Large Language Models like GPT are primarily built on which architecture

- | | |
|------------------------------|------------------------------------|
| (A) transformer architecture | (B) recurrent neural networks only |
| (C) k nearest neighbours | (D) decision trees |

69. The process of adapting a pretrained model to a specific task with additional training is called

- | | |
|------------------|-------------------|
| (A) fine tuning | (B) quantization |
| (C) tokenization | (D) normalization |

70. In AI, the term hallucination refers to

- | | |
|---|------------------------------------|
| (A) a hardware failure | (B) a type of neural network layer |
| (C) a model generating plausible but factually incorrect output | (D) an image processing artifact |

71. Differential privacy is a technique used to

- | | |
|--|------------------------------|
| (A) visualize high dimensional data | (B) compress neural networks |
| (C) protect individual data privacy while allowing data analysis | (D) speed up model training |

72. A phishing attack is primarily a form of

- | | |
|---|------------------------|
| (A) software licensing issue | (B) network congestion |
| (C) social engineering to steal sensitive information | (D) hardware failure |

73. End to end encryption ensures that

- | | |
|--|---|
| (A) messages are stored in plain text on servers | (B) the service provider can read all messages |
| (C) data cannot be transmitted at all | (D) only sender and intended recipient can read the message |

74. The term zero day vulnerability refers to

- | | |
|------------------------------------|---|
| (A) a scheduled maintenance window | (B) a previously unknown flaw exploited before a fix is available |
| (C) an expired software license | (D) a bug discovered and immediately patched |

75. Which regulation governs data protection and privacy in the European Union

- | | |
|-----------|----------|
| (A) FERPA | (B) CCPA |
| (C) HIPAA | (D) GDPR |

76. AI governance frameworks primarily aim to

- | | |
|---|---|
| (A) maximize model size regardless of risk | (B) eliminate all human oversight |
| (C) ensure responsible, ethical and accountable use of AI systems | (D) restrict AI to academic research only |

77. Explainable AI refers to methods that

- | | |
|---|--|
| (A) only apply to linear regression | (B) make model predictions interpretable to humans |
| (C) increase model complexity unnecessarily | (D) hide model decision processes |

78. In computer vision, a convolutional neural network is well suited for processing

- | | |
|--------------------------|---------------------------------------|
| (A) sequential text data | (B) audio waveforms exclusively |
| (C) tabular data only | (D) image data with spatial structure |

79. Which career role focuses on designing and deploying machine learning pipelines in production

- | | |
|-------------------------------|-------------------------|
| (A) machine learning engineer | (B) data entry operator |
| (C) network administrator | (D) graphic designer |

80. The term prompt engineering refers to

- | | |
|--|-----------------------------|
| (A) crafting effective inputs to guide AI language model outputs | (B) writing compiler code |
| (C) designing hardware prompts | (D) building circuit boards |

81. Federated learning allows model training by

- | | |
|--|---|
| (A) training across decentralized devices without sharing raw data | (B) centralizing all data on one server |
| (C) using only synthetic data | (D) removing the need for any data |

82. A confusion matrix in classification helps evaluate

- | | |
|-------------------------|---|
| (A) encryption strength | (B) data storage capacity |
| (C) network bandwidth | (D) model performance across true and false positives and negatives |

83. The role of an AI ethics officer in an organization primarily involves

- | | |
|-----------------------------|---|
| (A) writing marketing copy | (B) managing hardware procurement |
| (C) designing company logos | (D) overseeing responsible and fair use of AI systems |

84. Multi factor authentication improves security by

- | | |
|--------------------------------------|--|
| (A) using only a single password | (B) requiring two or more independent verification methods |
| (C) sharing credentials across users | (D) disabling all passwords |

85. A firewall in network security functions to

- | | |
|---|----------------------------------|
| (A) translate programming languages | (B) speed up internet connection |
| (C) monitor and control incoming and outgoing network traffic | (D) encrypt all stored files |

86. The concept of edge computing refers to

- | | |
|--|---|
| (A) eliminating the need for the internet | (B) processing data closer to where it is generated |
| (C) processing data far from the source in centralized clouds only | (D) storing data on physical paper |

87. Which career path involves protecting organizations from cyber threats

- | | |
|---------------------------|-------------------------|
| (A) cybersecurity analyst | (B) warehouse manager |
| (C) data entry clerk | (D) graphic illustrator |

88. Transfer learning in AI involves

- | | |
|---|-------------------------------------|
| (A) reusing a pretrained model's knowledge for a new related task | (B) ignoring existing datasets |
| (C) training a model from scratch every time | (D) deleting previous model weights |

89. Bias in AI models often arises from

- | | |
|--|---------------------------------|
| (A) unrepresentative or skewed training data | (B) using no data at all |
| (C) excessive regularization only | (D) perfectly balanced datasets |

90. Which of the following best describes cloud computing

- | | |
|--|--|
| (A) a programming language | (B) delivering computing services over the internet on demand |
| (C) a type of weather forecasting software | (D) storing and processing data physically on a personal device only |

91. A chatbot's natural language understanding component primarily helps it

- | | |
|-----------------------------|---|
| (A) manage hardware drivers | (B) compile source code |
| (C) render images | (D) interpret and comprehend human language input |

92. The term algorithmic accountability refers to

- | | |
|---|--------------------------------------|
| (A) holding organizations responsible for the impacts of their algorithms | (B) removing all algorithms from use |
| (C) using only manual decision making | (D) ignoring algorithm outcomes |

93. Reinforcement learning trains an agent primarily through

- | | |
|--|----------------------------------|
| (A) labeled datasets only | (B) static rule based systems |
| (C) rewards and penalties from interacting with an environment | (D) unsupervised clustering only |

94. Which career combines statistics, programming, and domain expertise to extract insights from data

- | | |
|--------------------|-----------------|
| (A) mechanic | (B) librarian |
| (C) data scientist | (D) electrician |

95. A recommendation system commonly uses which technique to suggest products

- | | |
|---------------------------------|------------------------------|
| (A) collaborative filtering | (B) random number generation |
| (C) manual curation exclusively | (D) static rule tables only |

96. The Turing test evaluates

- | | |
|--|--------------------------------|
| (A) whether a machine can exhibit intelligent behaviour indistinguishable from a human | (B) memory storage capacity |
| (C) computer processing speed | (D) graphics rendering quality |

97. Ransomware is malicious software that primarily

- | | |
|--|------------------------------------|
| (A) encrypts victim data and demands payment for release | (B) improves network security |
| (C) backs up data automatically for free | (D) speeds up computer performance |

98. In AI model evaluation, cross validation is used to

- | | |
|---|---|
| (A) train the final production model only | (B) assess how well a model generalizes to independent data |
| (C) replace the need for testing entirely | (D) increase dataset size artificially |

99. A career as a prompt engineer or AI product manager reflects the growing demand for

- | | |
|------------------------------------|--|
| (A) traditional assembly line work | (B) skills bridging AI capabilities with practical business applications |
| (C) outdated typewriting skills | (D) purely manual clerical work |

100. Model compression techniques like pruning and quantization are primarily used to

- | | |
|--|--------------------------------------|
| (A) reduce model size and inference cost while retaining performance | (B) increase model size for accuracy |
| (C) eliminate the need for training data | (D) replace GPUs with CPUs only |

Answer Key — Class 12 Sample Question Paper

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	D	21	B	41	D	61	B	81	A
2	C	22	B	42	C	62	B	82	D
3	D	23	B	43	C	63	B	83	D
4	D	24	A	44	A	64	C	84	B
5	C	25	B	45	C	65	A	85	C
6	C	26	B	46	A	66	D	86	B
7	A	27	B	47	B	67	D	87	A
8	A	28	D	48	D	68	A	88	A
9	C	29	B	49	D	69	A	89	A
10	A	30	C	50	D	70	C	90	B
11	B	31	C	51	B	71	C	91	D
12	C	32	B	52	A	72	C	92	A
13	A	33	D	53	A	73	D	93	C
14	A	34	A	54	A	74	B	94	C
15	A	35	B	55	C	75	D	95	A
16	B	36	B	56	B	76	C	96	A
17	D	37	B	57	B	77	B	97	A
18	A	38	D	58	A	78	D	98	B
19	A	39	B	59	D	79	A	99	B
20	D	40	A	60	B	80	A	100	A

Section-wise Distribution of Answers

Section	Questions	A	B	C	D
Section A — Subject Knowledge	1 – 20	8	2	5	5
Section B — Reasoning & Mathematics	21 – 40	3	12	2	3
Section C — General Knowledge & Current Awareness	41 – 60	6	5	4	5
Section D — Future Skills, Technology & AI Awareness	61 – 100	14	10	8	8

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