

# B.Sc.(Hons.) in Computer Science ADMISSION TEST

## Model Question Paper

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### INSTRUCTIONS TO CANDIDATES

**Sub-test I - VERBAL SKILLS**  
40 questions (40 x 1 = 40 Marks)

**SHORT ESSAY TEST**  
(1 x 10 = 10 marks)

**Sub-test II - MATHEMATICALSKILLS**  
60 questions (60 x 1 = 60 Marks)

**Sub-test III - LOGICAL REASONING &  
QUANTITATIVE APTITUDE**  
60 questions (60 x 1 = 60 Marks)

Total duration: 3hours

1. You are required to write your
  - (i) Applicant ID
  - (ii) Question Paper Code no. and SHADE THE NUMERALS appropriately in the space provided on the RESPONSE SHEET.
  - (iii) Room number and
  - (iv) Date.
2. Choose the correct answer from the Question Paper and SHADE THE CORRECT RESPONSE viz., A, B, C, D or E. Only one response must be clearly shaded for each question. More than one entry, unclear entries or wrong entries will **ATTRACT NEGATIVE MARKS**.
3. Please **DO NOT WRITE** your name or Applicant ID or the answer in the QUESTION PAPER BOOKLET.
4. Use of electronic calculator is strictly not permitted.

# B.Sc.(Hons.) in Computer Science ADMISSION TEST

## Model Question Paper

### SUB TEST – I

### VERBAL SKILLS

**Instructions:** Each question, 1 through 40, is followed by 5 answers – A through E. Indicate your correct answer by shading the appropriate choice viz., A, B, C, D or E, provided against each question number in the RESPONSE SHEET.

Max. Marks: 40 x 1: 40

### SAMPLE QUESTIONS

#### DIRECTIONS 1-10:

The following sentences require you to identify errors in grammar, usage, style, and mechanics. Not every sentence has an error, and no sentence will have more than one error. Each sentence error, if there is one, is underlined and lettered. If there is an error, select the one underlined part that must be changed to make the sentence correct

- 1) Some people claim(A) this is (B) the decade of fitness, but, in fact, (C) at least one-third of the American population are classified (D) as obese. No error (E).
- 2) During the graduation ceremonies, (A) the superintendent of schools told the story of the desks and cites their cleaning (B) as evidence of (C) a new spirit of responsibility among students.(D) No error.(E)
- 3) The twins are fond of peanuts and eating ice cream (A), but their parents (B) are loath to give the children (C) snacks between meals. (D) No error.
- 4) The real estate broker promised to notify my partner and I (B) as soon as the house was put up for sale (C) so we could make (D) any necessary repairs to the structure. No error. (E)
- 5) Either the witness or the defendant were lying, (A) but the judge was unable (B) to determine which (C) of the two men was committing perjury. (D) No error. (E)
- 6) A close friend of the family, (A) the patient was referred (B) to a psychologist with several emotional problems (C) to receive counseling. (D) No error. (E)
- 7) The speaker didn't say nothing (A) that the audience had not already heard; as a result, (B) the audience quickly (C) lost interest in his speech and began to talk (D) among themselves. No error. (E)
- 8) The Word workshop trains employees (A) about maximizing skills to improve(B) employees' productivity, the Internet (C) training teaches employees how to use the Internet (D) for product searches and e-mail to worldwide subscribers. No error. (E)
- 9) The recipe was complex(A) but is worth it (B) because chicken and biscuits made this way(C) tastes more deliciously. (D) No error. (E)
- 10) The prominent lawyer won more awards than anyone at(A) the ceremony, which surprised her (B) because she had long taken (C) on unpopular cases and defendants. (D) No error. (E)

**DIRECTIONS 11-20:** The following sentences have one or two blanks, each of which indicates a missing word. Beneath each sentence are five words or pairs of best fits the meaning of the sentence as a whole. Indicate your answer by filling in the corresponding circle on your answer sheet. words. Choose the word or pair of words which, when inserted in the sentence,

- 11) It was at this moment, as I stood there with the rifle in my hand, that I first grasped the hollowness, the —— of the imperialistic dominion of the East.  
(A) success  
(B) triumph  
(C) neutrality  
(D) future  
(E) futility
- 12) Her unexpected demise, at first mistakenly diagnosed as due to a —— fever, was later —— poison.  
(A) mild, attributed to  
(B) moderate, blamed on  
(C) raging, ascribed to  
(D) savage, caused by  
(E) simple, occasioned by
- 13) She looked bloated, like a body long —— in motionless water, and of that —— hue.  
(A) aloft, robust  
(B) immersed, ruddy  
(C) atop, pellucid  
(D) baptized, rosy  
(E) submerged, pallid
- 14) The pawnbroker's widow was a(n) —— old woman who loved to gossip and hear herself talk.  
(A) taciturn  
(B) garrulous  
(C) withdrawn  
(D) vicious  
(E) uncommunicative
- 15) The caretaker did not know she was due in London today (her call there had been planned as a surprise), so his —— in the manner of leaving this letter, leaving it to wait in the dusk and dust, annoyed her.  
(A) alertness  
(B) attentiveness  
(C) delicateness  
(D) negligence  
(E) frugality
- 16) That is, some books are to be read only in parts; others to be read but ——, and some few to be read wholly and with —— and attention.  
(A) cursorily, diligence  
(B) quickly, lethargy  
(C) gingerly, neglect  
(D) thoughtfully, laxity  
(E) discreetly, disregard
- 17) Through one of the broken panes I heard rain impinge upon the earth again and again, the fine —— needles of water playing in the already —— flower beds.  
(A) ceaseless, groomed  
(B) eternal, prim  
(C) incessant, sodden  
(D) gentle, straight  
(E) pungent, saturated
- 18) The —— student —— at the idea that he had to give a speech in class.  
(A) timid, recoiled  
(B) frail, rejoiced

- (C) fragile, revealed
- (D) insolent, relapsed
- (E) bold, repined

- 19) Now and then we would see her standing motionless in one of the downstairs windows like the carven torso of a(n) \_\_\_\_\_ in a(n) \_\_\_\_\_, looking or not looking at us, we could never tell which.
- (A) statue, mistrial
  - (B) idle, nook
  - (C) idol, niche
  - (D) ruffian, courtroom
  - (E) reprobate, window
- 20) A thin \_\_\_\_\_ pall as of the tomb seemed to lie everywhere upon this room decked and furnished as for a wedding, with a silver hairbrush so tarnished that the monogrammed initials were \_\_\_\_\_.
- (A) luscious, shrouded
  - (B) pure, sheltered
  - (C) caustic, apparent
  - (D) agreeable, camouflaged
  - (E) acrid, obscured

**Questions 21 to 22 are based on the following passages.**

*Both of the following passages concern World War II, 1939–1945. The first passage is excerpted from an article on the events leading up to World War II. The second passage is a comment by Anne Frank. She was the teenager whose diary of her experiences hidden in a secret annex during World War II became famous after her death.*

**Passage 1**

- 1 World War I (1914–1918) ended for Germany in total defeat. The German people were dissatisfied: the peace treaty was a great humiliation, there was no money, no work and no hope of a better future. In the chaotic 1920s, an unknown Austrian worked his way up to the position of “Führer” (leader) of an insignificant political party in Munich. His name was Adolf Hitler; the party called itself the NSDAP and its followers were called “Nazis.”
- 5 After an unsuccessful coup d’etat, Hitler was put in a comfortable prison, where he wrote his plans for world domination in a book called *Mein Kampf* (My Struggle). Hitler said that the German people were “Aryans,” the strongest and best race. All other races were inferior, especially the Jews, whom he blamed for everything that was wrong and for all Germany’s defeats. Hitler’s ideas appealed to many Germans and the NSDAP soon became powerful. In 1933, Hitler was appointed Chancellor of Germany and, within a year, consolidated all power within
- 10 his grasp. The concentration camps filled up—first with political opponents, particularly Communists and trade union leaders, but soon with Jews, Gypsies, homosexuals; in brief, everyone who disagreed with him or whom he regarded as inferior. The Nazi oppression of the Jews was marked by two significant events: The Nuremberg Laws and the Wannsee Conference. The Nuremberg laws, passed in 1935, deprived Jews of citizenship. Jews were forbidden from marrying non-Jews, working in the professions (including law, medicine, journalism, and teaching), and using public transportation. Jews could not drive cars (even their own) or go to the movies or theaters. At the Wannsee Conference, a top-level Nazi meeting in 1942, the “Final Solution of the Jewish Question” was set into motion—the extermination of all Jews in Europe. All of life in Germany from 1933 on was oriented towards preparation for war. Few people, however, realized this. In September of 1939, World War II began with the invasion of Poland. Between then and 1945, this war was to cost nearly 55 million people their
- 20 lives. Between the German invasion of the Soviet Union in 1941 and the end of the war in Europe in May 1945, Nazi Germany and its accomplices strove to murder every Jew under their domination. The Jews were not the only victims of Hitler’s regime, but they were the only group that the Nazis sought to destroy entirely.

**Passage 2**

I don’t believe that the big men, the politicians and the capitalists alone, are guilty of the war. Oh no, the little man is just as guilty, otherwise the peoples of the world would have risen in revolt long ago! There’s in people simply an urge to destroy, an urge to kill, to murder and rage, until all mankind, without exception, undergoes a great change, wars will be waged, everything that has been built up, cultivated, and grown will be destroyed and disfigured, after which mankind will have to begin all over again.

- 21) The writer of passage 1 uses the redundant phrase “total defeat” (line 1) to
- (A) imply that the Germans were not at fault for losing World War I
  - (B) infer that the Germans were overpowered from the start
  - (C) emphasize the German feeling of complete and utter disgrace after their defeat
  - (D) hint that not all Germans felt the same way about the debacle
  - (E) suggest the Germans deserved their defeat in both World War I and World War II
- 22) Why does the writer place the word *Fuhrer* (line 3) in quotation marks?
- (A) to draw attention to it
  - (B) to show it is a foreign word
  - (C) to comment ironically that Hitler was no leader
  - (D) to make sure that people pronounce it correctly
  - (E) because it is deliberately misspelled for emphasis
- 23) From the details in the passage, what can you infer was Hitler’s reason for writing *Mein Kampf*, his plans for world domination?
- (A) He did not have enough to do in jail.
  - (B) He always had literary aspirations and considered himself a fine writer.
  - (C) He needed the money that the publication would bring to finance his political aspirations.
  - (D) He wanted to justify and legitimize his strategy to the widest possible audience.
  - (E) He had been asked to create the plan by his political party.
- 24) According to passage 1, the Nazis oppression of the Jews was marked by all the following events *except*
- (A) forbidding Jews from marrying non-Jews
  - (B) depriving Jews of citizenship
  - (C) forbidding Jews from working as teachers and from using public transportation
  - (D) blaming Jews for Germany’s defeat in World War I
  - (E) forcing Jews to leave the country
- 25) Based on the details in passage 1, why do you think Hitler’s ideas appealed to many Germans?
- (A) Hitler came from a well-educated, cultured family so he attracted people looking for a strong leader.
  - (B) The Germans were looking for someone who could both find a scapegoat for their humiliation and improve economic conditions.
  - (C) Hitler was an outsider so he could bring fresh, new ideas into the country.
  - (D) The Germans were swayed by the high quality of Hitler’s writing in *Mein Kampf*.
  - (E) Unlike other leaders of the time, Hitler could carry through on his promises.
- 26) Passage 1 is organized according to
- (A) chronological order
  - (B) least-to-most important events
  - (C) most-to-least important events
  - (D) cause and effect
  - (E) reasons and causes
- 27) In passage 2, the phrase “big men” (line 36) is used to connote
- (A) powerful people
  - (B) non-Jews
  - (C) physically strong people
  - (D) rulers removed from the action
  - (E) expatriates living safely abroad
- 28) In passage 2, Anne Frank sees people as
- (A) very different, depending on their economic status
  - (B) essentially kind, but misruled by tyrants

- (C) responsible for their own fate  
 (D) welcoming change as a way to start anew  
 (E) helpless pawns on the world stage
- 29) As used in line 44, the word *disfigured* most nearly means  
 (A) misshapen (B) assassinated (C) handicapped (D) wounded (E) marred
- 30) These passages are similar in that both  
 (A) were written by the same author  
 (B) describe the same event in world history  
 (C) approach the topic from the same point of view  
 (D) were written for the same audience and purpose  
 (E) have a marked bias
- 31) In what way is the tone of passage 2 different from the tone of passage 1?  
 (A) The tone of passage 2 is lighter and less serious than the tone of passage 1.  
 (B) The tone of passage 2 more serious than the tone of passage 1.  
 (C) The tone of passage 2 is less factual than the tone of passage 1.  
 (D) The tone of passage 2 is more sardonic and sarcastic than the tone of passage 1.  
 (E) The tone of passage 2 is darker and more pessimistic than the neutral tone of passage 1.
- 32) What does the second passage add to your understanding of the events leading up to and culminating in World War II in Europe?  
 (A) How all people reacted to these events  
 (B) How these events affected one individual  
 (C) Why these events mattered on the world stage  
 (D) How these events affected the oppressed Jews of Germany  
 (E) Ways to prevent future wars

**Questions 33 to 40 are based on the following passage.**

1 *Millions of years ago, dinosaurs roamed the earth freely. About 65 million years ago, they all died out. Few*  
*mysteries have been as baffling—and as compelling—as the disappearance of the dinosaurs. Here are some of*  
*the latest theories. Dinosaurs roamed the earth for nearly 150 million years; then they suddenly died out and*  
 5 *became extinct. No one knows exactly why. Paleontologists once thought that dinosaurs had such small,*  
*inefficient brains that they were somehow responsible for their own dying out. Because dinosaur remains have*  
*been found in so many different parts of the world, scientists have had a hard time coming up with a single strong*  
*explanation for their sudden demise. There are a lot of theories, however, and some of them are fantastic. Some*  
 10 *observers, for example, have suggested that the dinosaurs vanished because of raids by extraterrestrial beings.*  
*Other theories are more logical but still guesses. The dinosaurs could have died because of some mass disease.*  
*That seems unlikely, though, because of the way they were dispersed all over the world. Some speculate that an*  
*exploding star bathed the earth in radiation, killing all the dinosaurs. This does not explain why all the other*  
*creatures on earth survived. There is also a theory that dinosaurs disappeared because of overcrowding. One*  
 15 *well-regarded theory concerns food sources. According to this theory, the dinosaurs ate too many flowering*  
*plants and absorbed poisonous chemicals. Since they did not have a well-developed sense of taste, the dinosaurs*  
*did not realize that they were eating something that would harm them. These theories remain just that however—*  
*theories—because no one to date has been able to prove any of them.*

- 33) Who or what are *paleontologists* (line 4)?  
 (A) A type of dinosaur  
 (B) Extinct life forms  
 (C) Dinosaur bones  
 (D) A scientific theory that does not have much credence  
 (E) Scientists who study extinct forms of animal life
- 34) As used in line 5, the word *remains* most nearly means  
 (A) leavings (B) skeletons (C) stay behind (D) cadavers (E) remnants

- 35) According to the information in the first paragraph, what is one possible cause for the dinosaurs' disappearance?  
 (A) The paleontologists killed them.  
 (B) They were inefficient creatures who did not use their food sources wisely.  
 (C) They were unable to survive because of their small brains.  
 (D) They were attacked by other, more fierce, creatures.  
 (E) They lived in many different parts of the world.
- 36) Which sentence best states the main idea of the first paragraph?  
 (A) No one really knows why the dinosaurs vanished.  
 (B) It is a real shame that we no longer have dinosaurs to study.  
 (C) It is relatively easy to study dinosaurs because so much is already known about them and they are found in so many places around the world.  
 (D) Paleontologists learn about vanished forms of animal life.  
 (E) Dinosaurs had such small brains that they could not meet the demands of a changing world.
- 37) By calling the theories "fantastic" (line 13), the writer is suggesting that on the whole these theories are  
 (A) well deserving of merit      (B) creative but unrealistic      (C) totally unreasonable  
 (D) wild and unproved            (E) scholarly and authoritative
- 38) Which information in the second paragraph can be verified by an outside source?  
 (A) Visitors from outside our solar system killed off the dinosaurs.  
 (B) There are many theories that attempt to explain the dinosaurs' disappearance.  
 (C) The dinosaurs vanished because of a plague.  
 (D) A star blew up and sent off radiate on that killed all the dinosaurs.  
 (E) The dinosaurs died off when they ate the wrong food.
- 39) The description in the second paragraph moves from  
 (A) least logical to most logical  
 (B) most logical to least logical  
 (C) causes to effects  
 (D) chronological order: most distant past to more recent events  
 (E) inductive to deductive reasoning
- 40) Which of the following choices can be inferred from the information in the second paragraph?  
 (A) Very soon, scientists will be able to prove one or more of the theories about the dinosaurs' disappearance.  
 (B) Most of the theories of the dinosaurs' disappearance are not backed up by sufficient facts to be convincing.  
 (C) The same exploding star that killed off the dinosaurs also killed off many early cave people.  
 (D) The disappearance of the dinosaurs is one of the most important problems facing scientists today and has great impact on other research.  
 (E) The reason for the dinosaurs' disappearance has puzzled many scientists.

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## B.Sc.(Hons.) in Computer Science ADMISSION TEST

### SUB TEST – II

### MATHEMATICAL SKILLS

**Instructions:** Each question, 41 through 160, is followed by 5 answers – A through E. Indicate your correct answer by shading the appropriate choice viz., A, B, C, D or E, provided against each question number in the RESPONSE SHEET.

Max. Marks: 60 x 1: 60

#### SAMPLE QUESTIONS

- 41) For a complex number  $a + ib$ , with  $a \neq 0$  &  $b \neq 0$ , its multiplicative inverse is :
- A)  $\frac{a}{a^2 + b^2} + i \frac{-b}{a^2 + b^2}$       B)  $\frac{a-ib}{a^2-b^2}$       C)  $\frac{1}{a-ib}$   
D)  $a - ib$       E)  $\frac{a+ib}{a^2 + b^2}$
- 42) If  $\alpha, \beta$  are the zeroes of quadratic polynomial  $ax^2 + bx + c$  then  $\alpha\beta =$
- A)  $b/a$       B)  $-b/a$       C)  $c/a$       D)  $-c/a$       E)  $a/b$
- 43) If the zeroes of the polynomial  $x^3 - 3x^2 + x + 1$  are  $a - b, a, a + b$ , then  $a = ?$ ,  $b = ?$
- A)  $1, \sqrt{2}$       B)  $1, -1$       C)  $\sqrt{3}, 1$       D)  $\sqrt{2}, 1$       E)  $\sqrt{2}, -1$
- 44) The value of  $n$ , such that,  $\frac{nP_4}{(n-1)P_4} = \frac{5}{3}$ ,  $n > 4$  is :
- A) 5      B) 10      C) 7      D) 8      E) 9
- 45) In an A.P., if the  $m^{\text{th}}$  term is  $n$  and the  $n^{\text{th}}$  term is  $m$ , where  $m \neq n$ , then the  $p^{\text{th}}$  term is :
- A)  $n - \frac{m}{p}$       B)  $\frac{p}{n} - n$       C)  $n - m + p$   
D)  $m - n - p$       E)  $n + m - p$
- 46) The income of a person is Rs.3,00,000/- in the first year and he receives an increase of Rs.10,000/- to his income per year for the next 19 years. The total amount he received in 20 years is :
- A) 79 lakhs      B) 98 lakhs      C) 67 lakhs      D) 68 lakhs      E) 96 lakhs
- 47) The marks obtained by a student in the first and second examinations are 62 and 48. With a total three examinations, how much should he get in the third and final examinations to maintain an average of at least 60 marks ?
- A) less than 65      B) more than 66  
C) between 60 to 70      D) exactly 100      E) more than or equal to 70

- 48) What is the radius of a circle in which a central angle of  $60^\circ$  intercepts an arc of length 37.4 cm ?  
 ( $\pi = 22/7$ )  
 A) 17.5 cm    B) 34 cm    C) 35.4    D) 35.7 cm    E) 17.4 cm
- 49) The minute hand of a watch is 1.5 cm long. How far does its tip move in 40 minutes ? ( $\pi = 3.14$ )  
 A) 6.28 cm    B) 3.14 cm    C) 9.42 cm    D) 22 cm    E) 7 cm
- 50) If the arcs of the same lengths in two circles subtend angles  $65^\circ$  and  $110^\circ$  at the centre, what is the ratio of their radii ?  
 A) 1 : 2    B) 7 : 22    C) 13 : 7    D) 2 : 7    E) 22 : 13
- 51)  $\sin 15^\circ = ?$   
 A)  $\frac{1+\sqrt{3}}{2\sqrt{2}}$     B)  $\frac{1-\sqrt{3}}{2\sqrt{2}}$     C)  $\frac{\sqrt{3}-1}{2\sqrt{2}}$     D)  $\frac{\sqrt{3}}{2\sqrt{2}}$     E)  $\frac{1}{2\sqrt{2}}$
- 52)  $\frac{2 \tan x}{1 + \tan^2 x} = ?$   
 A)  $\tan 2x$     B)  $\sin 2x$     C)  $\cos 2x$     D)  $\tan 3x$     E)  $\cot 2x$
- 53) The equation of the line through  $(-2, 3)$  with slope  $-4$  is :  
 A)  $4x + y + 5 = 0$     B)  $x + 4y + 5 = 0$   
 C)  $5x + 4y + 1 = 0$     D)  $5x + y + 1 = 0$   
 E)  $4x + 5y + 1 = 0$
- 54) The equation of the line which makes intercepts  $-3$  and  $2$  on the  $x$  and  $y$  - axes respectively is:  
 A)  $3x - 2y + 6 = 0$     B)  $2x + 3y + 6 = 0$   
 C)  $3x + 2y - 6 = 0$     D)  $2x - 3y + 6 = 0$   
 E)  $2x - 3y - 6 = 0$
- 55) The two lines  $a_1x + b_1y + c_1 = 0$  and  $a_2x + b_2y + c_2 = 0$  where  $b_1, b_2 \neq 0$ , are parallel if,  
 A)  $a_1 a_2 = b_1 b_2$     B)  $\frac{a_1}{b_1} = \frac{a_2}{b_2}$   
 C)  $a_1 a_2 = -b_1 b_2$     D)  $a_1 a_2 = \frac{b_1}{b_2}$   
 E)  $b_1 b_2 = \frac{a_1}{a_2}$
- 56) The equation of the circle with centre  $(-3, 2)$  and radius 4 is :  
 A)  $x^2 + y^2 - 6x - 5y = 3$     B)  $x^2 + y^2 - 4x - 5y = 3$   
 C)  $x^2 + y^2 + 6x - 4y = 3$     D)  $x^2 + y^2 - 6x + 4y = 3$   
 E)  $x^2 + y^2 + 6x + 4y = 3$
- 57) The eccentricity of the ellipse  $9x^2 + 4y^2 = 36$  is :  
 A)  $\frac{\sqrt{3}}{5}$     B)  $\frac{1}{\sqrt{5}}$     C)  $\frac{\sqrt{5}}{3}$     D)  $\frac{3}{\sqrt{5}}$     E)  $\frac{1}{\sqrt{3}}$

- 58)  $\lim_{x \rightarrow 1} \left( \frac{x^{15} - 1}{x^{10} - 1} \right) = ?$
- A)  $\frac{3}{2}$     B) undefined    C)  $+\infty$     D)  $-\infty$     E)  $\frac{2}{3}$
- 59)  $\lim_{x \rightarrow 0} \left( \frac{\sin 4x}{\sin 2x} \right) = ?$
- A) Undefined    B) 2    C) 1    D)  $\frac{1}{2}$     E)  $+\infty$
- 60) The solution of  $\frac{dy}{dx} = \frac{1 - \cos x}{1 + \cos x}$
- A)  $y = 2 \tan \frac{x}{2} - x + c$     B)  $y = \tan \frac{x}{2} - 2x + c$   
 C)  $y = \tan x - x + c$     D)  $y = \tan x + x + c$     E)  $y = \tan x + 2x + c$
- 61) Which of the following differential equations has  $y = c_1 e^x + c_2 e^{-x}$  as the general solution?
- A)  $\frac{d^2 y}{dx^2} + y = 0$     B)  $\frac{d^2 y}{dx^2} - y = 0$     C)  $\frac{d^2 y}{dx^2} + 1 = 0$     D)  $\frac{d^2 y}{dx^2} - 1 = 0$     E)  $\frac{d^2 y}{dx^2} + y^2 = 0$
- 62) The general solution of  $\frac{dy}{dx} = e^{(x+y)}$  is
- A)  $e^x + e^y = c$     B)  $e^x + e^y = c$     C)  $e^{-x} + e^y = c$   
 D)  $e^{-x} + e^{-y} = c$     E)  $e^{-y} = c$
- 63) The anti derivative of  $(\sqrt{x} + \frac{1}{\sqrt{x}})$  is
- A)  $\frac{1}{3} x^{\frac{1}{3}} + 2x^{\frac{1}{2}} + c$     B)  $\frac{2}{3} x^{\frac{2}{3}} + 2x^2 + c$   
 C)  $\frac{2}{3} x^{\frac{2}{3}} + 2x^{\frac{1}{2}} + c$     D)  $\frac{3}{2} x^{\frac{3}{2}} + \frac{1}{2} x^{\frac{1}{2}} + c$   
 E)  $\frac{1}{3} x^{\frac{1}{3}} + 3x^{\frac{1}{3}} + c$
- 64)  $\int e^x \sec x (1 + \tan x) dx$  equals
- A)  $e^x \cos x + C$     B)  $e^x \sec x + C$     C)  $e^x \sin x + C$   
 D)  $e^x \tan x + C$     E)  $e^x \cot x + C$
- 65) The area bounded by y-axis,  $y = \cos x$  and  $y = \sin x$  when  $0 \leq x \leq \frac{\pi}{2}$  is
- A)  $2(\sqrt{2} - 1)$     B)  $\sqrt{2} - 1$     C)  $\sqrt{2} + 1$   
 D)  $\sqrt{2}$     E)  $2(\sqrt{2} + 1)$
- 66) If  $\vec{a}$  is a non zero vector of magnitude 'a' and ' $\lambda$ ' a non zero scalar, then  $\lambda \vec{a}$  is unit vector if
- A)  $\lambda = 1$     B)  $\lambda = -1$     C)  $a = |\lambda|$     D)  $a = \frac{1}{|\lambda|}$     E)  $\lambda = 0$
- 67) Let the vectors  $\vec{a}$  and  $\vec{b}$  be such that  $|\vec{a}| = 3$  and  $|\vec{b}| = \frac{\sqrt{2}}{3}$  then  $\vec{a} \times \vec{b}$  is a unit vector if the angle between  $\vec{a}$  and  $\vec{b}$  is

- A)  $\frac{\pi}{6}$       B)  $\frac{\pi}{4}$       C)  $\frac{\pi}{3}$       D)  $\frac{\pi}{2}$       E)  $\pi$

68) Area of a rectangle having vertices A,B,C,D, with position Vector  $-\hat{i} + \frac{1}{2}\hat{j} + 4\hat{k}$ ,  $\hat{i} - \frac{1}{2}\hat{j} + 4\hat{k}$ ,  $\hat{i} - \frac{1}{2}\hat{j} + 4\hat{k}$  and  $\hat{i} - \frac{1}{2}\hat{j} + 4\hat{k}$  respectively is

- A) 1/2      B) 1      C) 2      D) 4      E) 3

69) Find the value of 'p' so that the lines  $\frac{1-x}{3} = \frac{7y-14}{2p} = \frac{z-3}{2}$  and  $\frac{7-7x}{3p} = \frac{y-5}{1} = \frac{6-z}{5}$  are at right angles

- A)  $\frac{70}{11}$       B)  $\frac{80}{12}$       C)  $\frac{70}{12}$       D)  $\frac{80}{11}$       E) 71

70) Find the variance of first 'n' natural numbers

- A)  $\frac{n^2+1}{2}$       B)  $\frac{n(n-1)}{2}$       C)  $\frac{n^2-1}{2}$       D)  $\frac{n(n+1)}{2}$       E)  $\frac{n(n+1)}{12}$

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\* \* \*

## SUB TEST – III

### LOGICAL REASONING & QUANTITATIVE APTITUDE

**Instructions:** Each question, 101 through 160, is followed by 5 answers – A through E. Indicate your correct answer by shading the appropriate choice viz., A, B, C, D or E, provided against each question number in the RESPONSE SHEET.

Max. Marks : 60 x 1 : 60

#### SAMPLE QUESTIONS

##### Quantitative Aptitude

- 101) The difference between a number and its three-fifth is 50. What is the number?  
(A) 75 (B) 100 (C) 125 (D) 80 (E) None of these
- 102) Some persons decide to raise Rs. 3 lakhs by equal contribution from each of them. If they contributed Rs. 50 extra each, the contribution increased to Rs. 3.25 lakhs. How many persons were there ?  
(A) 400 (B) 500 (C) 600 (D) 700 (E) None of these
- 103) A sample of milk contains 5% water. What quantity of pure milk should be added to 10 litres of milk to reduce the water content to 2%?  
(A) 5 litres (B) 7 litres (C) 15 litres (D) 12 litres (E) None of these
- 104) The difference between the compound interest and the simple interest on a certain sum of money at 5% per annum for 2 years is Rs. 1.50. Find the sum.  
(A) Rs. 800 (B) Rs. 1200 (C) Rs. 400 (D) Rs. 600 (E) None of these
- 105) A, B and C contract a work for Rs. 550. Together A and B are supposed to do  $\frac{7}{11}$ th of the work. How much does C get?  
(A) Rs. 270 (B) Rs. 200 (C) Rs. 310 (D) Rs. 175 (E) None of these
- 106) Animesh and Anand together got a profit of Rs. 9,600 and they distributed between themselves in the ratio of 5 : 7. What is the share of Animesh?  
(A) Rs. 4,000 (B) Rs. 5,600 (C) Rs. 4,800  
(D) Rs. 5,200 (E) None of these
- 107) For which of the following values of x the inequality  $x(x + 3) < 10$  is satisfied?  
(A)  $X > 2, x < -5$  (B)  $-3 < x < 0$  (C)  $-2 < x < 5$  (D)  $X < -2, x > 5$  (E) None of these
- 108) There is a leak in the bottom of a cistern. When the cistern is thoroughly repaired, it would be filled in  $3\frac{1}{2}$  hours. It now takes half an hour longer. If the cistern is full, how long will the leak take to empty the cistern?  
(A) 24 hours (B) 28 hours (C) 21 hours (D) 27 hours (E) None of these

- 109) If the diagonals of a rhombus are 8 cm and 10 cm respectively what will be the area of the rhombus?  
 (A) 35 sq cm            (B) 40 sq cm            (C) 30 sq cm            (D) 20 sq cm            (E) None of these
- 110) Some toys were distributed equally among 18 children in such a way that the number of toys each child gets is equal to the total number of children and after distribution 6 toys are left out. What was the total number of toys?  
 (A) 324            (B) 330            (C) 336            (D) 320            (E) None of these
- 111) A shopkeeper allows 10% discount on the price of an article and sells it for Rs. 7,600. What is the market price of the article ?  
 (A) Rs. 8,250            (B) Rs. 8,500            (C) Rs. 8,540            (D) Rs. 8,415            (E) None of these
- 112) If  $2x + 3y = 10$  and  $y < 4$ , then  
 (A)  $x > -1$             (B)  $x < -1$             (C)  $x > 0$             (D)  $x < 0$             (E) None of these
- 113) Ram started his journey at 9.00 a.m. at 8 km/hour. Hamid started from the same spot in the same direction at 9.30 a.m. at 10 km/hour. Hamid overtakes Ram at:  
 (A) 11.00 a.m.            (B) 12.30 p.m.            (C) 12.00 noon            (D) 11.30 a.m.            (E) None of these
- 114) A can do a piece of work in 12 days and B can do it in 10 days and A, B and C together in 5 days. C alone can do it in:  
 (A) 17 days            (B) 27 days            (C) 60 days            (D) 30 days            (E) None of these
- 115) What least number must be subtracted from each of the numbers 17, 17, 34, 42 so that the ratio of first two is the same as the ratio of the next two?  
 (A) 0            (B) 1            (C) 2            (D) 7            (E) None of these
- 116) A circular road runs around a circular garden. If the sum of the circumferences of the inner and outer circles is 88 metres and the radius of the inner circle is one-third of the outer circle, then the width of the road is :  
 (A) 4 metres            (B) 5 metres            (C) 6 metres            (D) 7 metres            (E) None of these
- 117) A city has a population of 3,00,000 out of which 1,80,000 are males. 50% of the population is literate. If 70% of the males are literate, the number of literate females is:  
 (A) 20,000            (B) 24,000            (C) 30,000            (D) 34,000            (E) None of these
- 118) The cost price of an article is Rs. 100. To gain 50% after allowing a 50% discount, the market price of the article is:  
 (A) Rs. 200            (B) Rs. 400            (C) Rs. 350            (D) Rs. 300            (E) None of these
- 119) In three annual examinations, of which the aggregate marks of each was 500, a student secured average marks 45% and 55% in the first and the second yearly examinations respectively. To secure 60% average total marks, it is necessary for him in third yearly examination to secure marks :  
 (A) 300            (B) 350            (C) 400            (D) 450            (E) None of these
- 120) If RUNNER is coded by SUMMER, the code for WINTER will be:  
 (A) XIMSER            (B) VINTER            (C) SINVER            (D) VIOUER            (E) None of these

- 121) P is 300 kms eastward of O and Q is 400 kms north of O. R is exactly in the middle of Q and P. The distance between Q and R is:
- (A) 300 kms            (B) 350 kms            (C) 250 kms    (D)  $250\sqrt{2}$  kms            (E) None of these
- 122) A man borrows Rs. 1200.00 from a bank for a period of 3 months. He finds that he has to repay Rs. 1236.00. The bank rate of interest is:
- (A) 3%            (B) 6%            (C) 12%            (D) 24%            (E) None of these
- 123) In climbing a round pole of 80 metres height, a monkey climbs 5 metres in a minute and slips 2 metres in the alternate minute. To get to the top of the pole, the monkey would take :
- (A) 51 minutes            (B) 54 minutes            (C) 58 minutes    (D) 61 minutes            (E) None of these
- 124) 84 A man travels by a car for 3 days. He traveled 10 hours each day. He drove on the first day at 45km/hr, second day at 40 km/hr and third day at 20 km/hr. His average speed was :
- (A) 30 km/hr            (B) 35 km/hr            (C) 38 km/hr    (D) 40 km/hr            (E) None of these
- 125) Forty three persons went to a canteen which sold cold drink 'Maaza' and 'Pepsi'. If 18 persons took Maaza only, 8 took Pepsi only and 5 took nothing, find how many took both the drinks :
- (A) 35            (B) 21            (C) 12            (D) 26            (E) None of these
- 126) A man works for 2 days and then rests for one day, then works for 2 days and rests for one day and so on. For everyday he works, he earns Rs. 100. How much will he earn from Monday to Saturday?
- (A) Rs. 200            (B) Rs. 300            (C) Rs. 400            (D) Rs. 500            (E) None of these
- 127) A rectangular plot of lawn of length and width respectively  $x$  and  $y$  metres is surrounded by a pathway of 2 metres width. The total area of pathway is :
- (A)  $2x + 2y + 4$             (B)  $2x + 2y + 8$             (C)  $4x + 4y + 8$   
(D)  $4x + 4y + 16$             (E) None of these
- 128) A square park is surrounded by a path of uniform width 2 metres all round it. The area of the path is 288 sq. metres. The perimeter of the park is
- (A) 142 m            (B) 128 m            (C) 136 m            (D) 118 m            (E) None of these
- 129) What is the sum of  $5x^3 - 3x^2 - 1$  and  $3x^2 + 1$ ?
- (A)  $5x^3$             (B)  $6x^2$             (C)  $5x$             (D)  $3x^2$             (E) None of these
- 130) The price of T.V. set inclusive of sales tax of 9% is Rs. 13.407. Find its marked price.
- (A) Rs. 12,300            (B) Rs. 11,500            (C) Rs. 12,500  
(D) Rs. 12,400            (E) None of these

### Logical Reasoning Aptitude:

**Questions 131 to 135: Read the following information carefully and answer the questions given below:**

- (1) A, B, C, D and E are five friends.
- (2) B is elder to E, but not as tall as C.
- (3) C is younger to A, and is taller to D and E.

- (4) A is taller to D, But younger to E.  
 (5) D is elder to A but is shorter in the group.

- 131) 91 Who among the following is the eldest?  
 (A) A (B) B (C) C (D) D (E) None of these
- 132) Which of the following pairs of students is elder to D?  
 (A) BA (B) BC (C) BE (D) EA (E) None of these
- 133) Which of the following statements (1-3) is correct about B?  
 (1) B is not the tallest  
 (2) B is shorter to E  
 (3) When they are asked to stand in ascending order with respect to their heights, B is in the middle  
 (A) Only (1) is correct  
 (B) Only (1) and (3) are correct  
 (C) All are correct  
 (D) All are incorrect  
 (E) None of these
- 134) If F, another friend is taller than C, how many of them will be between F and E according to their height?  
 (A) None (B) One (C) Two (D) Three (E) None of these
- 135) If a selection is to be made among them who would be relatively older and also taller, who among them should be chosen?  
 (A) A (B) B (C) C (D) D (E) E

**Qns 136-140 Read the following information and answer the questions given below it:**

- (1) Seven students P, Q, R, S, T, U and V take a series of tests.  
 (2) No two students get similar marks.  
 (3) V always scores more than P.  
 (4) P always scores more than Q.  
 (5) Each time either R scores the highest and t gets the least or Alternatively S scores the highest and U or Q scores the least.

- 136) If S is ranked sixth and Q is ranked fifth, which of the following can be true?  
 (A) V is ranked first or fourth  
 (B) R is ranked second or third  
 (C) P is ranked second or fifth  
 (D) U is ranked third or fourth  
 (E) T is ranked fourth or fifth.
- 137) If R gets more, V should be ranked not lower than:  
 (A) second (B) third (C) fourth (D) fifth (E) sixth
- 138) If R is ranked second and Q is ranked fifth, which of the following must be true?  
 (A) S is ranked third (B) T is ranked sixth (C) P is ranked Sixth  
 (D) V is ranked fourth (E) U is ranked sixth

- 139) If S is ranked second, which of the following can be true?  
 (A) U gets more than V    (B) V gets more than S    (C) P gets more than R  
 (D) P gets more than V    (E) T gets more than Q
- 140) If V is ranked fifth, which of the following must be true?  
 (A) S scores the highest    (B) R is ranked second    (C) T is ranked third  
 (D) Q is ranked fourth    (E) U scores the least

**Questions 141-145 are based on the information below. Read it and answer the questions.**

Six persons A, B, C, D, E and F are sitting in two rows, three in each.  
 E is not at the end of any row  
 D is second to the left of F.  
 C the neighbour of E, is sitting diagonally opposite to D.  
 B is the neighbour of F

- 141) Which of the following are sitting diagonally opposite to each other?  
 (A) F and C    (B) D and A    (C) A and C    (D) A and F    (E) A and B
- 142) Who is facing B?  
 (A) A    (B) C    (C) D    (D) E    (E) F
- 143) Which of the following are in same row?  
 (A) A and E    (B) E and D    (C) C and B    (D) A and B    (E) C and E
- 144) Which of the following are in one of the two rows?  
 (A) FBC    (B) CEB    (C) DBF    (D) AEF    (E) ABF
- 145) After interchanging seat with E, who will be the neighbours of D in the new position?  
 (A) C and A    (B) F and B    (C) only B    (D) only A    (E) only C

**Questions 146-150 Read the following information and answer the questions given below it:**

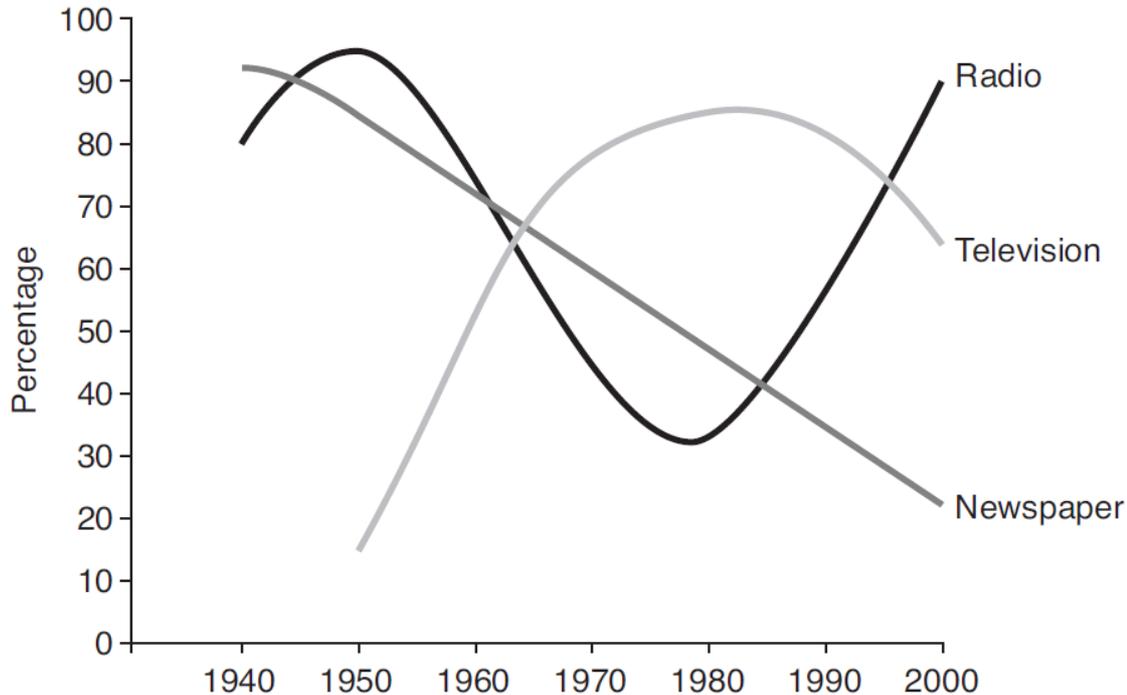
There are five friends Sachin, Kunal, Mohit, Anuj and Rohan.  
 Sachin is shorter than Kunal but taller than Rohan.  
 Mohit is tallest. Anuj is a little shorter than Kunal and little taller than Sachin.

- 146) Who is the shortest?  
 (A) Rohan    (B) Sachin    (C) Anuj    (D) Kunal    (E) None of these
- 147) If they stand in the order of their heights, who will be in the middle?  
 (A) Kunal    (B) Rohan    (C) Sachin    (D) Anuj    (E) None of these
- 148) If they stand in the order of increasing heights, who will be the second?  
 (A) Anuj    (B) Sachin    (C) Rohan    (D) Kunal    (E) None of these

- 149) Who is the second tallest?  
 (A) Sachin (B) Kunal (C) Anuj (D) Rohan (E) None of these
- 150) Who is taller than Anuj but shorter than Mohit?  
 (A) Kunal (B) Rohan (C) Sachin (D) Data Inadequate (E) None

**Questions 151-160 are based on the graph below. See it and answer the questions.**

A graph showing percentage trends in the number of households and their use of particular forms of media over the period 1940–2000 is given below.



- 151) In which decade did more than 50% of households first use television?  
 (A) 1960s (B) 1970s (C) 1980s (D) 1990s (E) None of these
- 152) In the 1970s, how many more households used TV rather than radio?  
 (A) Twice as many (B) Two to three times as many (C) Three times as many  
 (D) Cannot say (E) None of these
- 153) During the 1960s there were 30 million households and 70% used radio. How many households is this?  
 (A) 18 million (B) 19 million (C) 20 million (D) 21 million (E) None of these
- 154) In which decade was there a period when all three media were used in approximately equal proportions?  
 (A) 1940s (B) 1950s (C) 1960s (D) 1970s (E) None of these
- 155) Which period could best be described as the golden age of television?  
 (A) 1940s–1980s (B) 1960s–1980s (C) 1950s–1980s  
 (D) 1960s–1990s (E) None of these

- 156) What is the percentage range of households that use newspapers?  
(A) 20% (B) 50% (C) 70% (D) 90% (E) None of these
- 157) In which two decades was radio used in more households than both television and newspapers?  
(A) 1950s and 1990s (B) 1940s and 1990s (C) 1940s and 1950s  
(D) Cannot tell (E) None of these
- 158) In 2000, the graph shows that 90% of households used radio, 60% television and 20% newspapers. If 9 million households used newspapers, how many used radio?  
(A) 41 million (B) 40.5 million (C) 40 million  
(D) 39.5 million (E) None of these
- 159) In the 30-year period 1970–2000, which medium had the least variation in usage?  
(A) Television (B) Radio (C) Newspapers (D) Cannot tell (E) None of these
- 160) In their ‘heyday’ (the 1940s) newspapers were used by 19.8 million (90%) of households. This percentage had halved by the 1980s. How many households was this?  
(A) 9.9 million (B) 9.8million (C) 9.7 million (D) Cannot tell (E) None of these

\* \* \*