

# ASSIGNMENT 4

EE24BTECH11011 - PRANAY

## I. LINKED ANSWER QUESTIONS

### A. Statement for Linked Answer Questions 52 and 53

In the orthogonal turning of a bar of 100mm diameter with a feed of 0.25mm/rev, depth of cut of 4mm and cutting velocity of 90m/min, it is observed that the main (tangential) cutting force is perpendicular to the friction force acting at the chip-tool interface. The main (tangential) cutting force is 1500N.

53) The orthogonal rake angle of the cutting tool in degree is

- a) zero                      b) 3.58                      c) 5                      d) 7.16

54) The normal force acting at chip-tool interface in N is

- a) 1000                      b) 1500                      c) 2000                      d) 2500

### B. Statement for Linked Answer Questions 54 and 55:

In a simple Brayton cycle, the pressure ratio is 8 and temperatures at the entrance of compressor and turbine are 300 K and 1400 K, respectively. Both compressor and gas turbine have isentropic efficiencies equal to 0.8. For the gas, assume a constant value of  $c_p$  (specific heat at constant pressure) equal to 1kJ/kgK and ratio of specific heats as 1.4. Neglect changes in kinetic and potential energies.

54) The power required by compressor in kW/kg of gas flow rate is

- a) 194.7                      b) 243.4                      c) 304.6                      d) 378.5

55) The thermal efficiency of the cycle in percentage (%) is

- a) 24.8                      b) 38.6                      c) 44.8                      d) 53.1

## II. GENERAL APTITUDE QUESTIONS

### A. Q.56 to Q.60 carry one mark each

56) Complete the sentence: Universalism is to particularism as diffuseness is \_\_\_\_\_

- a) specificity                      b) neutrality                      c) generality                      d) adaptation

57) Were you a bird, \_\_\_\_\_ in the sky.

- a) would fly                      b) shall fly                      c) should fly                      d) shall have flown

58) Which one of the following options is the closest in meaning to the word given below?

**Nadir**

- a) Highest                      b) Lowest                      c) Medium                      d) Integration

59) Choose the grammatically **INCORRECT** sentence:

- a) He is of Asian origin  
b) They belonged to Africa  
c) She is an European  
d) They migrated from India to Australia

60) What will be the maximum sum of 44, 42, 40, ... ?

- a) 502                      b) 504                      c) 506                      d) 500

**B. Q.61 to Q.65 carry two marks each**

61) Out of all the 2-digit integers between 1 and 100, a 2-digit number has to be selected at random. What is the probability that the selected number is not divisible by 7?

- a)  $\frac{13}{90}$                       b)  $\frac{12}{90}$                       c)  $\frac{78}{90}$                       d)  $\frac{77}{90}$

62) A tourist covers half of his journey by train at 60 km/h, half of the remainder by bus at 30 km/h and the rest by cycle at 10 km/h. The average speed of the tourist in km/h during his entire journey is

- a) 36                      b) 30                      c) 24                      d) 18

63) Find the sum of the expression

$$\frac{1}{\sqrt{1} + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \frac{1}{\sqrt{3} + \sqrt{4}} + \cdots + \frac{1}{\sqrt{80} + \sqrt{81}} \quad (1)$$

- a) 7  
b) 8  
c) 9  
d) 10

64) The current erection cost of a structure is Rs. 13,200. If the labour wages per day increase by  $\frac{1}{5}$  of the current wages and the working hours decrease by  $\frac{1}{24}$  of the current period, then the new cost of erection in Rs. is

- a) 16,500                      b) 15,180                      c) 11,000                      d) 10,120

65) After several defeats in wars, Robert Bruce went in exile and wanted to commit suicide. Just before committing suicide, he came across a spider attempting tirelessly to have its net. Time and again, the spider failed but that did not deter it to refrain from making attempts. Such attempts by the spider made Bruce curious. Thus, Bruce started observing the near-impossible goal of the spider to have the net. Ultimately, the spider succeeded in having its net despite several failures. Such act of the spider encouraged Bruce not to commit suicide. And then, Bruce went back again and won many a battle, and the rest is history.

Which of the following assertions is best supported by the above information?

- a) Failure is the pillar of success.  
b) Honesty is the best policy.  
c) Life begins and ends with adventures.  
d) No adversity justifies giving up hope.