

1. What is the area of a land plot of length 140m and width 100m?

- (a) 1.4 sq.m
- (b) 1.4 acres
- (c) 1.4 Ares
- (d) 1.4 hectares

Correct Choice: (d)

Solution:

$$\text{Area} = 140 \times 100 = 14000 \text{ sq.m}$$

$$= 1.4 \times 10^4 \text{sq.m.}$$

$$= 1.4 \text{ hectares.}$$

(The hectare is an SI accepted metric system unit of area equal to a square with 100-metre sides, or 10,000 sq.m.)

2. Which among the following is a satellite based navigation system that can be used to locate positions?

- (a) GIS
- (b) GPS
- (c) Total Station
- (d) Distomat

Correct Choice: (b)

Solution:

GPS systems are extremely versatile and can be found in almost any industry sector. They can be used to map forests, help farmers harvest their fields, and navigate airplanes on the ground or in the air. GPS systems are used in military applications and by emergency crews to locate people in need of assistance.

3. Among the following, which is a parameter that can not be measured using total station?

- (a) Horizontal Angle
- (b) Vertical Angle
- (c) Slope Distance
- (d) Stopping Sight Distance

Correct Choice: (d)

Solution:

A total station (TS) or total station theodolite (TST) is an electronic/optical instrument used for surveying and building construction. It is an electronic transit theodolite integrated with electronic distance measurement (EDM) to measure both vertical and horizontal angles and the slope distance from the instrument to a particular point, and an on-board computer to collect data and perform triangulation calculations.

4. What is a dry rubble masonry?

- (a) Rubble masonry without mortar
- (b) Random Rubble masonry after complete curing
- (c) Random Rubble masonry without curing
- (d) Ashlar masonry

Correct Choice: (a)

Solution:

The construction of this form is similar to that of ordinary rubble masonry without mortar. Dry Rubble Masonry in which the stones are laid one upon other and the packing with cement mortar is not done. Moreover the locking of stones should be done careful so that the interlocking between them is strong and prevents slippery. These type of masonry is used for temporary works.

5. Which of the following rules is used to calculate area of a plot?

- (a) Bowditch's Rule
- (b) Simpson's Rule
- (c) Compass Rule
- (d) Transit Rule

Correct Choice: (b)

Solution:

The Bowditch Rule is a mathematical procedure used to bring the coordinates together. The relative error determined is then distributed to each coordinated point to compensate for the overall error. Surveyors talk about accuracy ratios as follows: 1 to 100,000, 1:750,500, etc.

In numerical analysis, Simpson's method is a method for numerical integration, the numerical approximation of definite integrals.

The compass rule may be stated as follows: the correction to be applied to the latitude or departure of any course is equal to the total closure of latitude or departure, multiplied by the ratio of the length of the course to the total length or perimeter of the traverse.

Transit Rule is based on the assumption that the error in departure (or latitude) of a traverse side is proportional to its departure (or latitude).

6. Among the following types of aggregates, which is preferred for concrete?

- (a) Uniformly graded aggregates
- (b) Well graded aggregates
- (c) Gap graded aggregates
- (d) Flaky and elongated aggregates

Correct Choice: (c)

Solution:

Generally coarse aggregate is blended with finer aggregates (such as sand) to fill in the spaces left between the large pieces and to "lock" the larger pieces together. This reduces the amount of cement paste required and decreases the amount of shrinkage that could occur.

7. In triangulation, what should be the included angle for a well conditioned triangle?

- (a) Between 20° and 90°
- (b) Between 20° and 130°
- (c) Between 30° and 90°
- (d) Between 30° and 120°

Correct Choice: (d)

Solution:

A well conditioned triangle mainly consists of nearly equilateral triangle, saying more precisely angles should lie between 30 and 120 degrees. Now this provision removes the ambiguity of locating the vertex of triangle while plotting the area.

8. Which of the following statement is incorrect?

- (a) Grillage foundation is constructed by rolled steel joists
- (b) Grillage foundation is constructed by mild steel beam sections
- (c) Grillage foundation is a deep foundation
- (d) Grillage foundation is a shallow foundation

Correct Choice: (c)

Solution:

Grillage Foundation is a type of foundation often used at the base of a column. It consists of one, two or more tiers of steel beams superimposed on a layer of concrete, adjacent tiers being placed at right angles to each other, while all tiers are encased in concrete.

9. What is a bullnose brick?

- (a) Brick with a rounded angle
- (b) Brick with two rounded angle on one end
- (c) Brick in the form of curved sector
- (d) Brick with rounded angle on four edges

Correct Choice: (c)

Solution:

It is basically a brick or paver with a rounded off edge. Bullnose brick is a style of brick that has one, some or all of its corners rounded off. These bricks can be used to create soft and attractive curved edges to steps, sills, or in capping walls.

10. Among the tests for bricks, which test is done with the help of finger nail?

- (a) Test for crushing strength
- (b) Soundness test
- (c) Hardness test
- (d) Efflorescence test

Correct Choice: (c)

Solution:

Hardness Test on Bricks for this test a sharp tool or finger nail is used to make scratch on brick. If there is no scratch impression on brick then it is said to be hard brick.

11. Which among the following sections contain only one flange and one web?

- (a) Rolled steel beams
- (b) T-sections
- (c) Channel sections
- (d) Angle sections

Correct Choice: (b)

Solution:

The top of the t-shaped cross section serves as a flange or compression member in resisting compressive stresses. The web (vertical section) of the beam below the compression flange serves to resist shear stress and to provide greater separation for the coupled forces of bending.

12. Which of the following is taken as fine aggregate?

- (a) Particles retained on 4.75 mm IS sieve
- (b) Particles passing through 4.75 mm IS sieve
- (c) Particles passing through 75 micron IS sieve
- (d) Particles retained on 80 mm IS sieve

Correct Choice: (b)

Solution:

Fine aggregate means the aggregate which passes through 4.75mm sieve. To find the fineness modulus of fine aggregate we need sieve sizes of 4.75mm, 2.36mm, 1.18mm, 0.6mm, 0.3mm and 0.15mm.

13. Which mix is a M_{20} concrete mix?

- (a) 1 : 1.5 : 3 (b) 1 : 2 : 4
(c) 1 : 1 : 2 (d) 1 : 4 : 8

Correct Choice: (a)

Solution:

Concrete mix ratios are usually in the form of cement : Sand : Aggregate. For example, if the concrete mix ratio of M_{20} concrete is 1 : 1.5 : 3 then 1 part of cement, 1.5 part of sand and 3 part of aggregate in volume should be taken to produce concrete.

14. Which pile is designed to take up the stressed during both driving and handling

- (a) sand pile (b) compaction pile
(c) cast-in-situ pile (d) pre-cast concrete pile

Correct Choice: (d)

Solution:

Precast concrete piles are usually pre stressed to withstand driving and handling stresses. Axial load capacity may reach 500 kips or more. They have high load capacity as friction piles in sand or where tip bearing on soil is important.

15. Which of the following is the feature of English bond?

- (a) header course starts with a header followed by a queen closer (b) each course consists of alternate header and stretcher
(c) every course consists of brick bats (d) header course starts with a queen closer

Correct Choice: (b)

Solution:

English bond (plural English bonds) (masonry) In bricklaying, an arrangement of bricks such that one course has the short sides of the bricks (headers) facing outwards, and the next course has the long sides of the bricks (stretchers) facing outwards.

16. Which is a plain bar section?

- (a) Fe 250 grade steel (b) Fe 415 grade steel
(c) Fe 500 grade steel (d) Fe 550 grade steel

Correct Choice: (d)

Solution:

Plain round rebar has a range of applications from reinforced concrete piers, bored piles and footings to walls, beams, columns, slabs and precast products. Round rebar from InfraBuild Construction Solutions is a Class N (normal ductility) bar and is available in 250 MPa for diameters 10–36mm.

17. What type of stone masonry is constructed using square or rectangular blocks?

- (a) Flint rubble masonry (b) Random rubble masonry
(c) Polygonal rubble masonry (d) Ashlar masonry

Correct Choice: (d)

Solution:

Ashlar is finely dressed (cut, worked) stone, either an individual stone that was worked until squared or the structure built from it. Ashlar is the finest stone masonry unit, generally rectangular cuboid, mentioned by Vitruvius as opus isodomum, or less frequently trapezoidal.

18. Which of the following is usually not considered as a survey station?

- (a) end point of a survey line (b) temporary bench mark
(c) point at which dumpy level is set up (d) point at which leveling staff is held

Correct Choice: (a)

Solution:

A station is the Horizontal measurement along the Survey Center Line of a project. Distances are measured and points are identified on plans with reference to Station Numbers. Station numbers usually increase from the beginning of the project to the end of the project.

19. The method of forecasting which is used when past data is not available is

- (a) Delphi method
- (b) Trend line technique
- (c) Historical analogy
- (d) None of these

Correct Choice: (a)

Solution:

Qualitative forecasting techniques are subjective, based on the opinion and judgment of consumers and experts; they are appropriate when past data are not available. They are usually applied to intermediate- or long-range decisions. Examples of qualitative forecasting methods are [citation needed] informed opinion and judgment, the Delphi method, market research, and historical life-cycle analogy.

20. When the water level falls below the safe limit the following device will extinguish the fire in the furnace of the boiler?

- (a) fusible plug
- (b) safety valve
- (c) blow off cock
- (d) feed check valve

Correct Choice: (a)

Solution:

Fusible Plug: The main purpose of a fusible plug is to extinguish the fire in the furnace of the boiler when the water level in the boiler falls below an unsafe level. Thus, explosion is avoided which may take place due to overheating of the tubes and shell.

21. The ability of the material to withstand shock is called:

- (a) ductility
- (b) toughness
- (c) hardness
- (d) fatigue strength

Correct Choice: (b)

Solution:

Toughness is the ability to withstand sudden shocks or blows. The IZOD impact test is a common test used to calculate the toughness of materials.

22. The following alloying element will increase the corrosion resistance of steel:

- (a) Titanium
- (b) Nickel
- (c) Chromium
- (d) Manganese

Correct Choice: (c)

Solution:

Corrosion resistance of various steel types increases with increase in chromium content. Corrosion-resistant steels are made by adding more than 12% of chromium—which results in the formation of a thin, chemically stable, and passive oxide film. The oxide film forms and heals itself in the presence of oxygen.

23. The part used to support the core in mould is called:

- (a) Chaplet
- (b) Slick
- (c) Lifter
- (d) Binder

Correct Choice: (a)

Solution:

Chaplets: Chaplets are used to support the cores inside the mould cavity to take care of its own weight and overcome the metallostatic force. Riser: A column of molten metal placed in the mould to feed. the castings as it shrinks and solidifies. Also known as "feed."

24. The angle at the point of drill bit is

- (a) 102°
- (b) 118°
- (c) 130°
- (d) 135°

Correct Choice: (b)

Solution:

The most common twist drill bit (sold in general hardware stores) has a point angle of 118 degrees, acceptable for use in wood, metal, plastic, and most other materials, although it does not perform as well as using the optimum angle for each material.

25. The process of embossing the diamond shaped pattern on work piece is called :

- (a) chamfering
- (b) parting

(c) facing

(d) knurling

Correct Choice: (d)

Solution:

Introduction to knurling process normally process of embossing the diamond or straight shaped pattern on to the work piece that is called knurling process. A knurling tool is used to press a pattern onto a round section. The pattern is normally used as a grip for a handle. As the saddle moves along the bed of the lathe the knurled pattern is pressed into the steel along its length. If the traverse of the lathe is stopped and then reversed a diamond pattern is produced.

26. The process of reducing activity time by adding resources resulting in the increase of cost is called:

(a) Reducing

(b) Updating

(c) Optimizing

(d) Crashing

Correct Choice: (d)

Solution:

Crashing is the technique to use when fast tracking has not saved enough time on the schedule. It is a technique in which resources are added to the project for the least cost possible. Crashing is another schedule compression technique where you add extra resources to the project to compress the schedule.

27. The PERT has an optimistic time of 4 days pessimistic time of 16 days and expected time of 10 days. The likely time of activity is:

(a) 14

(b) 12

(c) 10

(d) 8

Correct Choice: (c)

Solution:

$$\text{Mean (expected) time} = \frac{t_p + 4t_m + t_o}{6}$$

Here, Pessimistic time, $t_p = 16$

Most likely time, $t_m = ?$

Optimistic time, $t_o = 4$

Mean (expected) time = 10.

$$10 = \frac{16 + 4t_m + 4}{6}$$

$$t_m = \frac{60 - 20}{4} = 10.$$

28. The octane number of following fuel is 100:

(a) N-Heptane

(b) Butane

(c) Cetane

(d) Iso-Octane

Correct Choice: (d)

Solution:

Octane rating is the measure of a fuel's ability to resist "knocking" or "pinging" during combustion, caused by the air/fuel mixture detonating prematurely in the engine. In the U.S., unleaded gasoline typically has octane ratings of 87 (regular), 88-90 (midgrade), and 91-94 (premium). Octane numbers are based on a scale on which isooctane is 100 (minimal knock) and heptane is 0 (bad knock). The higher the octane number, the more compression required for fuel ignition. Fuels with high octane numbers are used in high performance gasoline engines.

29. The wage plan which guarantees minimum wage is:

(a) Halsey plan

(b) Gantt plan

(c) Emersons efficiency plan

(d) All of the above

Correct Choice: (a)

Solution:

Under Halsey Plan, the standard time for the completion of a job is fixed and the rate per hour is then determined. If the time taken by a worker is more than the standard time, then he shall be paid according to the time rate, i.e. time taken multiplied by the rate per hour.

30. As per ABC analysis, the item which consists more than 70% of total item with 5% to 10% inventory cost will come under:

(a) A type

(b) B type

(c) C type

(d) None of the above

Correct Choice: (a)

Solution:

A-items are goods which annual consumption value is the highest. The top 70-80% of the annual consumption value of the company typically accounts for only 10-20% of total inventory items.

31. The terms that is not included in the PERT terminology is:

- (a) Event
- (b) Node
- (c) Slack
- (d) Network Diagram

Correct Choice: (c)

Solution:

The program (or project) evaluation and review technique (PERT) is a statistical tool used in project management, which was designed to analyze and represent the tasks involved in completing a given project.

32. The control chart based on variables is:

- (a) P chart
- (b) C chart
- (c) R chart
- (d) U chart

Correct Choice: (c)

Solution:

Variables control charts are used to evaluate variation in a process where the measurement is a variable--i.e. the variable can be measured on a continuous scale (e.g. height, weight, length, concentration). There are two main types of variables control charts. One (e.g. x-bar chart, Delta chart) evaluates variation between samples. Non-random patterns (signals) in the data on these charts would indicate a possible change in central tendency from one sampling period to the next. One way of thinking about the use of a variables control chart is that you are testing the hypothesis that a particular sample mean came from the population of sample means represented by the control limits of the process. If the particular sample mean is within the control limits, your conclusion is that it does come from that population. If the particular sample mean is outside the control limits, your conclusion is that it may have come from some other distribution (i.e. a distribution with a mean that is higher or lower than this population mean. [NOTE: There are other signals that may indicate an out-of-control signal that will be discussed in the Lesson Six Presentation.]

The other type of variables control chart (e.g. R-chart, S-chart, Moving Range chart) evaluates variation within samples. Non-random patterns (signals) in the data on these charts would indicate a possible change in the variation within the samples.

33. The reversible engine has thermal efficiency of 20%. What will be the COP if it is used as a refrigerator with other conditions unchanged:

- (a) 2
- (b) 3.33
- (c) 4
- (d) 4.5

Correct Choice: (c)

Solution:

C.O.P is reciprocal of efficiency of heat engine. So $1/0.2 = 5 = \text{C.O.P of heat engine}$.

Now C.O.P of refrigerator = c.o.p of heat engine-1 = $5-1 = 4$.

34. The property which is valid for prediction but not valid for forecasting is:

- (a) subjective
- (b) reproducible
- (c) scientific
- (d) none of the above

Correct Choice: (d)

35. The component which is not always in contact with fly wheel is:

- (a) crank shaft
- (b) friction plate
- (c) pressure plate
- (d) clutch cover

Correct Choice: (b)

Solution:

A friction clutch plate is used in vehicles to allow the transmission input shaft and engine to run at the same speed when rotating. ... When the clutch is engaged, the friction plate is sandwiched between the engine flywheel and a steel pressure plate that is bolted to the flywheel.

36. The most nuclear fuel used in the world is:

- (a) Thorium232
- (b) Uranium238
- (c) Uranium235
- (d) Plutonium239

Correct Choice: (c)

Solution:

These fuels are fissile, and the most common nuclear fuels are the radioactive metals uranium-235 and plutonium-239.

37. If the supply frequency to the transformer is increased the iron loss will:

- (a) Not change
- (b) decreases
- (c) increases
- (d) any of the above

Correct Choice: (c)

Solution:

As frequency increases, the flux density in the core decreases but as the iron loss is directly proportional to the frequency hence effect of increased frequency will be reflected in increase of the iron losses.

38. Buchholz's relay gives warning and protection against

- (a) Fault inside transformer
- (b) Fault outside transformer
- (c) For both outside and inside
- (d) None of the above

Correct Choice: (a)

Solution:

Buchholz relay is used for the protection of transformers from the faults occurring inside the transformer. Short circuit faults such as inter turn faults, incipient winding faults, and core faults may occur due to the impulse breakdown of the insulating oil or simply the transformer oil.

39. Salient poles alternators are generally used on:

- (a) Low speed prime movers only
- (b) High speed prime movers only
- (c) Medium speed prime movers only
- (d) Low and medium speed prime movers

Correct Choice: (a)

Solution:

Poles are laminated to reduce eddy current loss. The salient pole type motor is generally used for low-speed operations of around 100 to 400 rpm, and they are used in power stations with hydraulic turbines or diesel engines.

40. The 8's complement of the number 240 is:

- (a) 537
- (b) 538
- (c) 540
- (d) 648

Correct Choice: (b)

Solution:

8's complement of a number is 1 added to its 7's complement number.

7's complement of 240 is

$$777 - 240 = 537$$

$$\text{Now add } 1 : 537 + 1 = 538$$

41. If $(11X1Y)_8 = (12C9)_{16}$, then the values of X and Y are:

- (a) 5,1
- (b) 7,5
- (c) 5,7
- (d) 3,1

Correct Choice: (d)

Solution:

$$(12C9)_{16} \implies 1 \implies 0001, 2 \implies 0010, C \implies 1100, 9 \implies 1001$$

group the digits in three to convert to octal

$$001, 001, 011, 001, 001 \implies 11311$$

42. The binary equivalent of the decimal number (5.4375) is

- (a) 101.1100
- (b) 101.0111
- (c) 101.1011
- (d) 101.1010

Correct Choice: (b)

Solution:

.4375 is converting to binary is multiply the number by 2 and the number left to the decimal point is the digit we want.

$$0.4375 \times 2 = 0.875 \Rightarrow 0$$

$$0.875 \times 2 = 1.75 \Rightarrow 1$$

$$0.75 \times 2 = 1.5 \Rightarrow 1$$

$$0.5 \times 2 = 1.0 \Rightarrow 1.$$

43. Pressure can be measured using:

(a) Venturimeter

(b) Differential pressure transmitter

(c) Potentiometer

(d) Manometer

Correct Choice: (d)

Solution:

A manometer is a scientific instrument used to measure gas pressures. Open manometers measure gas pressure relative to atmospheric pressure. A mercury or oil manometer measures gas pressure as the height of a fluid column of mercury or oil that the gas sample supports. All others measure pressure difference.

44. Which of the following test is conducted for measurement of workability of concrete

(a) Slump test

(b) Rebound hammer test

(c) Split tensile strength test

(d) None of these

Correct Choice: (a)

Solution:

Slump test-For measurement of workability of concrete
Rebound hammer test-To determine concrete strength
Split tensile strength-To determine tensile strength of concrete.

45. Which of the following is used for measurement of right angles in chain surveying

(a) Cross staff

(b) Optical square

(c) Prism square

(d) All of the above

Correct Choice: (d)

Solution:

Equipment for measurement of right angles

1-Cross staff

2-Prism square

3-Optical square

46. If D is the annual demand in unit, C is the order cost and H is the holding cost per unit per year, then the Economic Order Quantity (EOQ) is equal to

(a) $\sqrt{\frac{2C}{DH}}$

(b) $\sqrt{\frac{2CD}{H}}$

(c) $\sqrt{\frac{2CH}{D}}$

(d) $\sqrt{\frac{2H}{CD}}$

Correct Choice: (b)

Solution:

Economic order quantity (EOQ) is the the order size which minimizes the sum of carrying costs and ordering costs of a company's inventories. These include communication costs, transportation costs, transit insurance costs, inspection costs, accounting costs, etc. EOQ is

given by $\sqrt{\frac{2CD}{H}}$.

47. A fuel cell, in order to produce electricity, burns:

(a) Helium

(b) Nitrogen

(c) Hydrogen

(d) None of the above

Correct Choice: (c)

Solution:

Hydrogen, when burned in a combustion engine is a huge improvement in terms of emissions when compared to fossil fuels. ... A fuel cell directly converts the hydrogen fuel into electricity and is therefore inherently more efficient.

48. Transformers are rated in

(a) KW

(b) MW

(c) KVA

(d) KVAR

Correct Choice: (c)

Solution:

The Copper loss(I^2R) occurs due to the flow of the current in the transformer winding and the Iron or core loss occurs due to the voltage. These losses do not depend on the power factor so that is why the transformer rating in KVA not KW. These are the Three Reasons Why Transformer is Rated in KVA.

49. The ratio of starting torque to full load torque is least in

(a) DC series motor

(b) DC shunt motor

(c) DC compound motor

(d) None of the above

Correct Choice: (b)

Solution:

When DC motors are arranged in the order of their starting torques, it will be like

$$T_{series} > T_{compound} > T_{shunt}$$

So while comparing the DC motors which all made with the same full load torque, the ratio of starting torque to full load torque will be least for DC shunt motor.

50. The axial field strength of a solenoid increases :

(a) with increase in its length

(b) independent of length

(c) with decrease in length

(d) decrease in number of turns

Correct Choice: (b)

Solution:

Strength of the magnetic field can be increased by:

=> increasing the current in the coil

=> increasing the number of coils in the solenoid

=> using a soft iron core within the solenoid.

51. In a zener diode, the current is controlled by

(a) potential barrier

(b) Reverse bias voltage

(c) External circuits

(d) Zener diode resistance

Correct Choice: (c)

Solution:

In power supplies and many other circuits, Zener diode finds its application as a constant voltage provider or a voltage reference. The only conditions are that the input voltage should be greater than zener voltage and the series resistor should have a minimum value such that the maximum current flows through the device. so voltage given by an external circuit

52. For resistance measurement using a digital multimeter, it contains:

(a) High voltage source

(b) Low current source

(c) High resistance

(d) Low capacitance

Correct Choice: (b)

Solution:

Usually in the measurement of resistance, meter consists of a precision low current source applied across an unknown resistance which gives a d.c. voltage.

53. AC voltages are measured using a digital multimeter using:

(a) Capacitor and Resistors

(b) Inductor and Resistors

(c) Rectifiers and Filters

(d) Oscillators and Amplifiers

Correct Choice: (c)

Solution:

Rectifiers and filter circuits with various configurations are employed for measuring A.C. voltages. A.C. is converted to D.C. and is applied to the A/D converter.

54. Material used for making solar cells is

(a) Germanium

(b) Silicon

(c) Silver

(d) Aluminium

Correct Choice: (b)

Solution:

Pure crystalline silicon is a poor conductor of electricity as it is a semiconductor material at its core. ... In a solar cell, the layers are positioned next to each other and that way an electric field is created. When the sunlight hits the solar cell, the energy stimulates electrons that leave holes behind

55. The type of output generated in a thermocouple

- (a) Current
- (b) Voltage
- (c) Resistance
- (d) Capacitance

Correct Choice: (b)

Solution:

The Seebeck effect is a phenomenon in which a temperature difference between two dissimilar electrical conductors or semiconductors produces a voltage difference between the two substances. It is the working principle behind thermocouple

56. Which system software translates the instructions in mnemonic form into the machine language equivalent?

- (a) Compiler
- (b) Linker
- (c) Macro Processor
- (d) Assembler

Correct Choice: (d)

Solution:

An assembler is a program that converts assembly language into machine code. It takes the basic commands and operations from assembly code and converts them into binary code that can be recognized by a specific type of processor. Assemblers are similar to compilers in that they produce executable code

57. ----- permits the programmer to develop a program with size larger than the size of the main memory.

- (a) Memory Interleaving
- (b) Cache Memory
- (c) Virtual Memory
- (d) Buffering

Correct Choice: (c)

Solution:

Virtual memory is a memory management capability of an operating system (OS) that uses hardware and software to allow a computer to compensate for physical memory shortages by temporarily transferring data from random access memory (RAM) to disk storage.

58. Portability of a software refers to the ability :

- (a) to operate with different softwares in the system
- (b) to run on different hardware platforms
- (c) to adapt the changes efficiently
- (d) to offer dynamic user interfaces

Correct Choice: (b)

59. ----- is a preemptive scheduling algorithm.

- (a) FCFS
- (b) SJF
- (c) Priority
- (d) Round Robin

Correct Choice: (d)

Solution:

A round robin is an arrangement of choosing all elements in a group equally in some rational order, usually from the top to the bottom of a list and then starting again at the top of the list and so on.

60. An interpreter will :

- (a) places programs into the memory for execution
- (b) translate assembly language program to machine language program
- (c) execute a source program without generating object program
- (d) link the object modules for execution

Correct Choice: (c)

61. Which of the following is an example of divide and conquer algorithm?

- (a) Merge, Sort
- (b) Dijkstra's Algorithm
- (c) Banker's Algorithm
- (d) Prim's Algorithm

Correct Choice: (a)

62. In which addressing mode, the effective address of the operand is calculated by adding a constant value to the content of register?

- (a) Absolute Mode
- (b) Immediate Mode
- (c) Index Mode
- (d) Indirect Mode

Correct Choice: (c)

Solution:

Index Mode is used to access an array whose elements are in successive memory locations. The content of the instruction code, represents the starting address of the array and the value of the index register, and the index value of the current element.

63. The time complexity of a linear search algorithm is :

- (a) $O(\log_2 n)$
- (b) $O(n \log_2 n)$
- (c) $O(2n)$
- (d) $O(n)$

Correct Choice: (d)

64. The way a card game player arrange his cards as he picks them up one by one is an example of :

- (a) bubble sort
- (b) insertion sort
- (c) selection sort
- (d) merge sort

Correct Choice: (b)

Solution:

Insertion sort is a simple sorting algorithm that works the way we sort playing cards in our hands.

65. Memory protection of a computer is normally done by :

- (a) Operating System
- (b) Processor
- (c) Compiler
- (d) User

Correct Choice: (a)

Solution:

An operating system is the most important software that runs on a computer. It manages the computer's memory and processes, as well as all of its software and hardware. It also allows you to communicate with the computer without knowing how to speak the computer's language.

66. The ----- protocol is used for updating the main memory when a word is removed from the cache memory.

- (a) Write-through
- (b) Cache hit
- (c) Write-back
- (d) Protected Write

Correct Choice: (c)

Solution:

Write back is a storage method in which data is written into the cache every time a change occurs, but is written into the corresponding location in main memory only at specified intervals or under certain conditions. ... In write through mode, the main memory data always stays fresh.

67. The operation of reading instructions from the memory is called :

- (a) Instruction Cycle
- (b) Memory Write Cycle
- (c) Memory Read Cycle
- (d) Fetch Cycle

Correct Choice: (d)

Solution:

The fetch execute cycle is the basic operation (instruction) cycle of a computer (also known as the fetch decode execute cycle). During the fetch execute cycle, the computer retrieves a program instruction from its memory. It then establishes and carries out the actions that are required for that instruction.

68. The process of buffering data into the disk area for the later use by slower peripheral devices :

- (a) Caching
- (b) Spooling
- (c) Swapping
- (d) Thrashing

Correct Choice: (b)

Solution:

Spooling is a process in which data is temporarily held to be used and executed by a device, program or the system. Data is sent to and stored in memory or other volatile storage until the program or computer requests it for execution. "Spool" is technically an acronym for simultaneous peripheral operations online.

69. The static RAM consumes ----- power and ----- the dynamic RAM.

(a) More, Faster

(b) Less, Faster

(c) More, Slower

(d) Less, Slower

Correct Choice: (a)

70. The 8's complement of the number 240 is :

(a) 537

(b) 538

(c) 540

(d) 648

Correct Choice: (c)

71. What is the range of values that can be represented with an n-bit binary integers in signed 1's complement form?

(a) $-(2^{n-1} - 1)to + (2^{n-1} - 1)$

(b) $-(2^{n-1})to + (2^{n-1} - 1)$

(c) $-(2^n - 1)to + (2^n - 1)$

(d) $-(2^{n-1})to + (2^{n-1})$

Correct Choice: (a)

72. The division operation of a number (110.01101)₂ by (1.01)₂ gives :

(a) 10.1001

(b) 101.001

(c) 1010.01

(d) 1101.01

Correct Choice: (b)

73. The binary equivalent of the decimal number (5.4375)₁₀ is :

(a) 101.1100

(b) 101.0111

(c) 101.1011

(d) 101.1010

Correct Choice: (b)

74. ----- is the base of the numbers for which the operation $\frac{15}{4} = 13$ is correct.

(a) 8

(b) 6

(c) 12

(d) 10

Correct Choice: (a)

75. If $(11X1Y)_8 = (12C9)_{16}$, then the values of X and Y are :

(a) 5, 1

(b) 7, 5

(c) 5, 7

(d) 3, 1

Correct Choice: (d)

76. Two equal resistance are connected in series across a constant voltage source the total power consumed is P. If the same resistance are connected in parallel the new total power is given by

(a) 4 P

(b) 2 P

(c) P / 2

(d) P / 4

Correct Choice: (a)

Solution:

If the two resistors are connected in series, the equivalent resistance is $R_{EQ} = 2R$

If the two resistors are connected in parallel, the equivalent resistance is $R_{EQ} = \frac{R}{2}$

The power for the series combination is:

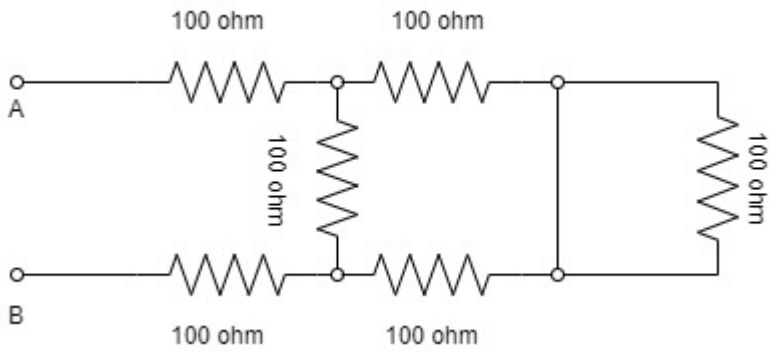
$$P_{series} = \frac{1}{2} \frac{V^2}{R}$$

The power for the parallel combination is:

$$P_{parallel} = 2 \frac{V^2}{R}$$

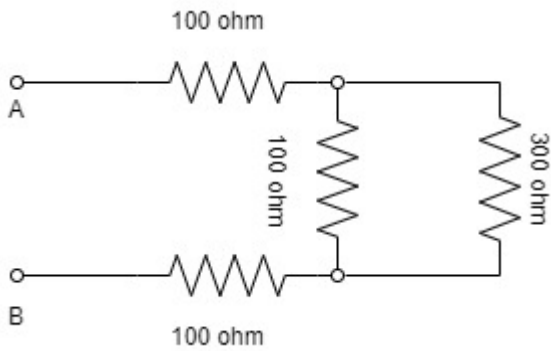
Thus the parallel combination dissipates 4 times the power of the series combination.

77. The equivalent resistance across AB for the fig 1 is :



- (a) 300Ω (b) $700 / 3 \Omega$
 (c) 275Ω (d) $1000 / 3 \Omega$

Correct Choice: (c)
 Solution:



Since the 100Ω were in series circuit the resultant $R = 300 \Omega$
 100Ω and 300Ω are in parallel connection and the resultant $R = 75 \Omega$
 Thus the effective resistance
 $R = 100 \Omega + 100 \Omega + 75 \Omega = 275 \Omega$

78. Aluminium can be classified as a:

- (a) Soft magnetic material (b) Diamagnetic material
 (c) Paramagnetic material (d) Ferromagnetic material

Correct Choice: (c)
 Solution:

Paramagnetic properties are due to the presence of some unpaired electrons, and from the realignment of the electron paths caused by the external magnetic field. These are metals that are weakly attracted to magnets. They include aluminum, gold, copper, magnesium, molybdenum, lithium, and tantalum

79. Two long single layer solenoids have the same length and same number of turns but are placed co axially one within other. The diameter of inner coil is 4 cm and that of outer coil is 8 cm . The coefficient of coupling between the coils is :

- (a) 0.5 (b) 0.2
 (c) 0.6 (d) 0.12

Correct Choice: (a)

Solution:

$$L = \frac{N^2 \mu_0 \mu_r a}{l}$$

$$\text{For coil 1 : } L_1 = \frac{N^2 \mu_0 \mu_r a_1}{l}$$

$$\text{For coil 2 : } L_2 = \frac{N^2 \mu_0 \mu_r a_2}{l}$$

The number of turns N and μ_r is same for two coils

$$\text{Considering coil 2 : } M = \frac{N_1 N_2 \mu_0 \mu_r a_2}{l} \text{ where } N_1 = N_2 = N$$

$$\therefore M = \frac{N^2 \mu_0 \mu_r a_2}{l}$$

a_1 is the cross sectional area of outer coil

a_2 is the cross sectional area of inner coil

$$\text{Coefficient of coupling , } k = \frac{M}{\sqrt{L_1 L_2}}$$

$$k = \frac{\frac{N^2 \mu_0 \mu_r a_2}{l}}{\sqrt{\frac{N^2 \mu_0 \mu_r a_1}{l} \times \frac{N^2 \mu_0 \mu_r a_2}{l}}} \Rightarrow \frac{a_2}{\sqrt{a_1 a_2}} = \frac{2^2}{\sqrt{2^2 4^2}} = \frac{4}{2 \times 4} = 0.5$$

80. The current changing at 0.1 A/ sec induces an e.m.f of 5 V. The self inductance of the coil is

- (a) 0.05 mH (b) 5 mH
(c) 0.5 mH (d) 20 mH

Correct Choice: (a)

Solution:

$$L = \frac{e}{\frac{di}{dt}}$$

$$L = \frac{5}{0.1} = 50 \text{ H} = 0.05 \text{ mH}$$

81. The total inductance across AB for the Fig : 2 is

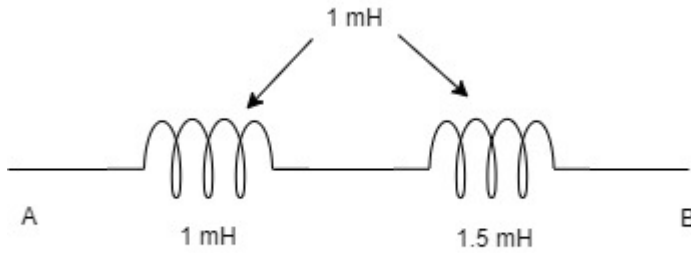


Fig : 2

- (a) 1 mH (b) 1.5 mH
(c) 3.5 mH (d) 0.5 mH

Correct Choice: (d)

Solution:

$$L_T = L_1 + L_2 - 2M_{12} = 1 + 1.5 - 2 = 0.5 \text{ mH}$$

82. The alternating voltage $v = 230 \sin(314t + \pi/3)$ is applied across AC circuit draws a current of $i = 10 \sin(314t - \pi/6)$. The power absorbed by the circuit is

- (a) 1150 w (b) 0 w
(c) 2300 w (d) 23 w

Correct Choice: (b)

Solution:

$$P = v \times i = 230 \sin(314t + \pi/3) \times 10 \sin(314t - \pi/6) = 2300 [\sin(314t + \pi/3) \sin(314t - \pi/6)] = \frac{2300}{2} [\cos(90^\circ) \cos(628t - 30^\circ)]$$

since $\cos(90^\circ) = 0 \Rightarrow P = 0 \text{ w}$

83. Two voltage sources $100 \angle 25^\circ \text{ V}$ and $100 \angle 25^\circ \text{ V}$ are connected in parallel across 50Ω resistance. The currents through the resistance is :

- (a) 4 A (b) 2 A
(c) 1 A (d) 0 A

Correct Choice: (b)

Solution:

Resultant $V = 100 \angle 25^\circ$ V (since they are in parallel connection)

$$I = \frac{I_m}{\sqrt{2}} \angle \theta A$$

$$V = \frac{R I_m}{\sqrt{2}} \angle \theta V$$

$$R = \frac{V}{I} \text{ (since voltage and current are in phase)}$$

$$I = \frac{V}{R} = \frac{100}{50} = 2A$$

84. Three 100Ω resistances are connected in delta across 400 V, 50 Hz, 3 - phase line. If one of the resistor is disconnected, the power taken by the load is :

(a) 3.2 kW

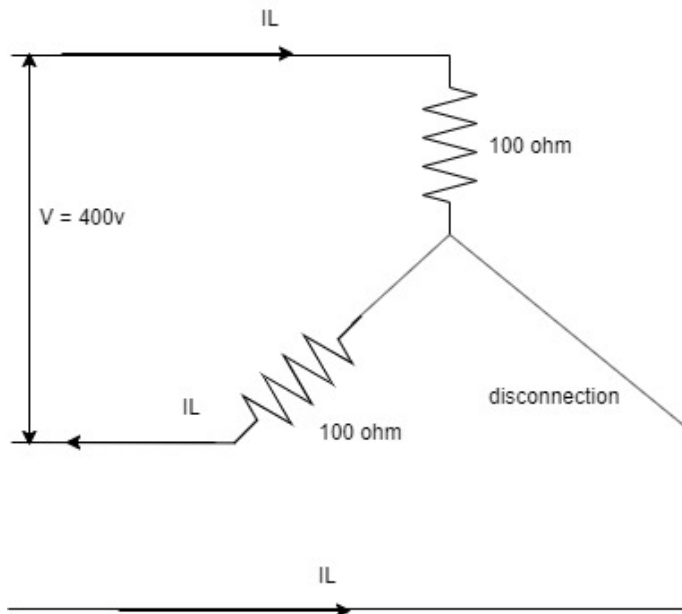
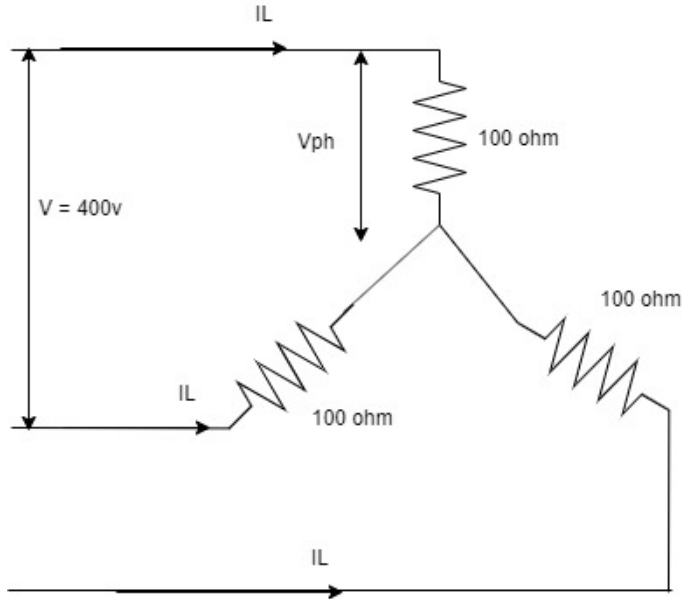
(b) 4.8 kW

(c) 2.7 kW

(d) 5.54 kW

Correct Choice: (b)

Solution:



When one of the resistors is disconnected the remaining two behave as if they were connected in series across the line voltage. The circuit behave as single phase circuit

$$I_{ph} = \frac{400}{100} = 4 A$$

$$I_L = 4 \times \sqrt{3} A$$

$$P = V_L \times I_L \times \cos \Phi = \sqrt{3} \times 400 \times 4 \times \sqrt{3} = 4800 W$$

85. Pressure can be measured using

(a) Venturimeter

(b) Differential pressure transmitter

(c) Potentiometer

(d) Manometer

Correct Choice: (b)

Solution:

Venturimeter : a device used for measuring the rate of flow of a fluid flowing through a pipe

Differential pressure transmitter : equipment will sense the difference in pressure between two ports and produce an output signal with reference to a calibrated pressure range

Potentiometer : device used to measure the internal resistance of a cell, to compare the e.m.f. of two cells and potential difference across a resistor

Manometer : scientific instrument used to measure gas pressures

86. GPRS stands for :

(a) Global Parallel Radio Service

(b) Guided Public Radio Service

(c) General Packet Radio Service

(d) None of the above

Correct Choice: (c)

Solution:

General Packet Radio Service (GPRS) is a packet oriented mobile data standard on the 2G and 3G cellular communication network's global system for mobile

87. Bluetooth operates around the frequency :

(a) 4.8 GHz

(b) 4.8 MHz

(c) 2.4 MHz

(d) 2.4 GHz

Correct Choice: (d)

Solution:

Bluetooth operates at frequencies between 2402 and 2480 MHz, or 2400 and 2483.5 MHz including guard bands 2 MHz wide at the bottom end and 3.5 MHz wide at the top. This is in the globally unlicensed (but not unregulated) industrial, scientific and medical (ISM) 2.4 GHz short-range radio frequency band

88. Type of stack used in 8085 is

(a) LIFO

(b) FIFO

(c) FILO

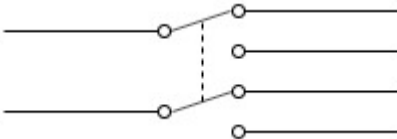
(d) LFFO

Correct Choice: (a)

Solution:

LIFO (Last In First Out) stack is used in 8085. In this type of Stack the last stored information can be retrieved first

89. Type of switch shown in the figure is a



(a) SPST

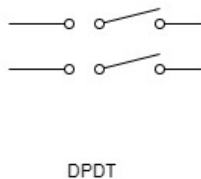
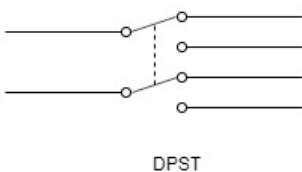
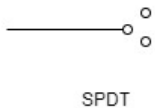
(b) SPDT

(c) DPDT

(d) DPST

Correct Choice: (d)

Solution:



90. If an amplifier produces an output power 10 times greater than its input power, what will be the gain in decibels ?

(a) 3 dB

(b) 6 dB

(c) 10 dB

(d) 20 dB

Correct Choice: (c)

Solution:

The DC power gain of an amplifier is equal to ten times the common log of the output to input ratio, where as voltage and current gains are 20 times the common log of the ratio.

$$\text{Gain} = 10 \log \frac{o/ppower}{i/ppower} = 10 \ln \frac{10 \times i/ppower}{i/ppower} = 10 \text{ dB}$$

91. Type of microphone which converts acoustic signals to change in capacitance is

- (a) Condenser microphone
- (b) Ribbon microphone
- (c) Dynamic microphone
- (d) Omni microphone

Correct Choice: (b)

Solution:

Condenser microphone : They capture a larger frequency range and have a good transient response, which is the ability to reproduce the "speed" of an instrument or voice. They also generally have a louder output but are much more sensitive to loud sounds

Ribbon microphone :natural mics that are used to capture the sound of an instrument, a voice, and even the ambience of a room

Dynamic microphone : sound waves cause a movable wire or coil to vibrate in a magnetic field and thus induce a current, to then be converted back to sound.

Omni microphone :microphones that pick up sound with equal gain from all sides or directions of the microphone. This means that whether a user speaks into the microphone from the front, back, left or right side, the microphone will record the signals all with equal gain

92. For a parallel plate capacitor with circular cross section , if the radius of the plate surface is halved , then the capacitance value :

- (a) reduces by a factor of 2
- (b) reduces by a factor of 4
- (c) increases by a factor of 2
- (d) increases by a factor of 4

Correct Choice: (c)

Solution:

$$Q = CV$$

$$C \propto A$$

where C is the capacitance and A is the cross sectional area

$$A \propto r^2$$

$$\therefore C \propto r^2$$

$$\frac{C'}{C} = \frac{r^2}{0.5r^2}$$

$$C' = 2C$$

93. The current in a 5 μH inductor is given by $6t + 3$ A. What is the value of inductor voltage across when $t = 3\text{sec}$?

- (a) $90\mu\text{V}$
- (b) $30\mu\text{V}$
- (c) $105\mu\text{V}$
- (d) $15\mu\text{V}$

Correct Choice: (c)

Solution:

$$L = 5 \mu\text{H}$$

$$\frac{di}{dt} = 21 \text{ A/sec}$$

$$V = L \times \frac{di}{dt} = 5 \times 21 = 105\mu\text{V}$$

94. When the charge on a capacitor is doubled , the energy stored :

- (a) increases by a factor of 2
- (b) increases by a factor of 4
- (c) decreases by a factor of 4
- (d) remains same

Correct Choice: (b)

Solution:

$$Q = C \times V$$

When Q is doubled V also get doubled as C is constant

$$\text{Stored energy, } E = \frac{1}{2} C \times V^2 \therefore E' \text{ becomes } 4E.$$

95. When a p-n junction is reverse biased :

- (a) holes and electrons move towards the junction
- (b) holes and electrons move away from the junction
- (c) movement of holes and electrons are seized
- (d) width of depletion region decreases

Correct Choice: (b)

Solution:

If the reverse biased voltage applied on the p-n junction diode is further increased, then even more number of free electrons and holes are pulled away from the p-n junction. This increases the width of depletion region. Thus, the minority charge carriers carry the electric current in reverse biased p-n junction diode.

96. A zener diode with high breakdown voltage has :

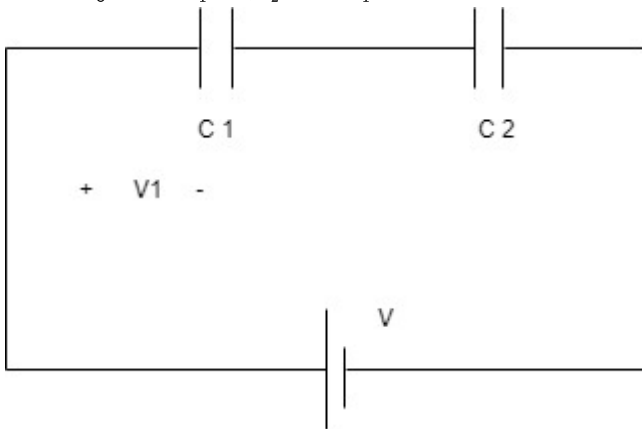
- (a) both p and n regions are lightly doped
- (b) both p and n regions are heavily doped
- (c) either p or n regions is lightly doped
- (d) none of the above

Correct Choice: (b)

Solution:

The zener breakdown occurs in heavily doped p-n junction diodes because of their narrow depletion region. At zener breakdown region, a small increase in voltage will rapidly increases the electric current. Zener breakdown occurs at low reverse voltage whereas avalanche breakdown occurs at high reverse voltage.

97. In the circuit given below $C_1 = 3\text{ F}$, $C_2 = 6\text{ F}$ and $V_1 = 4\text{ V}$. Find the value of V :



- (a) 2 V
- (b) 4 V
- (c) 12 V
- (d) 6 V

Correct Choice: (d)

Solution:

$$Q = CV$$

$$Q = C_1 \times V_1 = 3 \times 4 = 12$$

$$\frac{1}{C_{ef}} = \frac{1}{C_1} + \frac{1}{C_2}$$

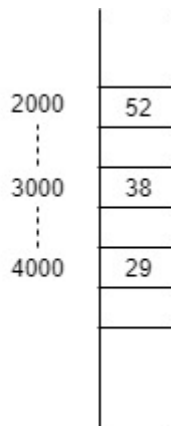
$$\frac{1}{C_{ef}} = \frac{1}{3} + \frac{1}{6} = \frac{3}{6}$$

$$C_{ef} = 2\text{F}$$

$$V = \frac{Q}{C_{ef}} = \frac{12}{2} = 6\text{ V}$$

98. Consider the following 8085 program

```
LDA    3000 H
MOV    B , A
LDA    4000 H
STA    3000 H
MOV    A , B
STA    4000 H
```



After the execution of the program the contents of location 4000 H is

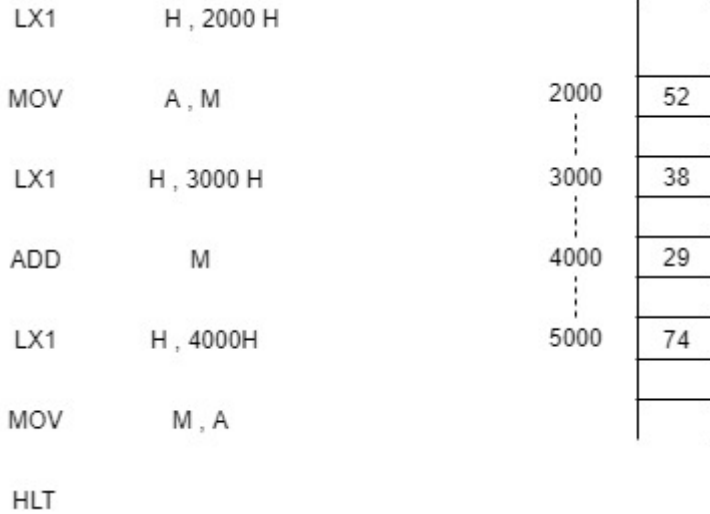
- (a) 52 H
- (b) 29 H
- (c) 38 H
- (d) 67 H

Correct Choice: (b)

Solution:

LDA 3000 H : "Get the contents of memory location 3000 H into accumulator"
MOV B, A : "Save the contents into B register"
LDA 4000H : "Get the contents of memory location 4000 H into accumulator"
STA 3000 H : "Store the contents of accumulator at address 3000 H"
MOV A, B : "Get the saved contents back into A register"
STA 4000 H : "Store the contents of accumulator at address 4000 H"

99. If the following program is executed in an 8085 microprocessor, the contents in location 4000 H is :



(a) 90 H

(b) 29 H

(c) 52 H

(d) 8 AH

Correct Choice: (a)

Solution:

LXI H 2000H : "HL points 2000H"
MOV A, M : "Get first operand"
LXI H 3000H : "HL points 3000H"
ADD M : "Add second operand"
LXI H 4000H : "HL points 4000H"
MOV M, A : "Store result at 4000 H"
HLT : "Terminate program execution"