# UPPSC <br> Polytechnic Lecturer 

 Electrical Engineering
## Mega Mock Challenge

 (October 26th - October 27th 2021)
## Questions \& Solutions

1. Kick fuses are used across relay coils to prevent relay operation during
A. Heavy external faults
B. Inrush current of transformer when they are energised
C. Line to ground faults
D. Bolted faults

Ans. B
Sol. In order to prevent operation of differential protection due to inrush of magnetising current of transformer, the "kick fuses" are provided across the relay coils.
2. Differential relays are used for the protection of equipment against
A. Internal faults
B. Over current
C. Reverse current
D. Reverse power

Ans. A
Sol. Differential relay works on the principle of difference between current entering and leaving the equipment. And hence it is insensible to external faults or changes.
3. A 3-phase circuit breaker is rated at 1250 A, 2000 MVA, $33 \mathrm{kV}, 4 \mathrm{~s}$. It's making current capacity will be
A. 35 kA
B. 89 kA
C. 79 kA
D. 69 kA

Ans. B
Sol. Making current $=2.55 \times$ times breaking current

$$
\begin{aligned}
\mathrm{I}_{\mathrm{m}} & =2.55 \frac{(2000) \mathrm{MVA}}{33 \sqrt{3} \mathrm{kV}} \\
& =89 \mathrm{kA}
\end{aligned}
$$

4. In a static over-current relay, inverse time characteristics are obtained by
A. A differentiating circuit
B. An integrating circuit
C. A transistor amplifier
D. A transistor switches

## Ans. C

Sol. In a static over-current relay, inverse time characteristics are obtained by transistor amplifier
5. Mho relay is
A. current restrained current relay.
B. voltage restrained directional relay.
C. current restrained directional relay.
D. voltage restrained current relay.

Ans. B
Sol. Torque equation is given $b y=t=k_{1} V I(\varphi-a)-k_{2} V^{2}-k_{3}$
The operating torque is provided by VI element while the restraining torque is provided by voltage element. Therefore a MHO relay can be called as voltage restrained directional relay.
6. Which of the following circuit breaker is generally used in railway electrification?
A. Air Blast circuit breaker
B. Minimum Oil circuit breaker
C. Bulk Oil circuit breaker
D. $\mathrm{SF}_{6}$ circuit breaker

Ans. A
Sol. Air Blast circuit breaker is generally used in railway electrification.
7. The restriking voltage is measured in
A. RMS value
B. Peak value
C. Instantaneous value
D. Average value

Ans. B
Sol. The restriking voltage is measured in Peak value.
8. A power plant has to supply loads as follows:

12 pm to $5 \mathrm{am}=500 \mathrm{~kW} ; 2 \mathrm{pm}$ to $5 \mathrm{pm}=2500 \mathrm{~kW}$
5 am to $10 \mathrm{am}=800 \mathrm{~kW} ; 5 \mathrm{pm}$ to $8 \mathrm{pm}=2000 \mathrm{~kW}$
10 am to 12 noon $=2000 \mathrm{~kW} ; 8 \mathrm{pm}$ to $10 \mathrm{pm}=1500 \mathrm{~kW}$
12 noon to $2 \mathrm{pm}=1000 \mathrm{~kW} ; 10 \mathrm{pm}$ to $12 \mathrm{pm}=1000 \mathrm{~kW}$
Total units during 24 hours and load factor will be respectively
A. 51.66 units, $31 \%$
B. 31 k units, $51.66 \%$
C. 31 k units $33 \%$
D. None of the above

Ans. B
Sol.


Total units $=500 * 5+800 * 5+2000 * 2+1000 * 2+2500 * 3+2000 * 3+1500 * 2+1000 * 2$
=31000 units
Load factor= average output/maximum output
Average output=31000/24=1291.67
Maximum output=2500
Load factor $=1291.67 / 2500=0.5166$
9. A controller essentially is a/an
A. Amplifier
B. Sensor
C. Comparator
D. Clipper

Ans. C

Sol. A controller essentially is a comparator where the input and feedback are compared in order to produce an error signal.
10. Programming Languages for PLC is/are
A. Ladder Diagram
B. Function Block Diagram
C. Structured Text
D. All of the above

Ans. D
Sol. Programming Languages for PLC are all the given options ie.
Ladder Diagram (LD)
Sequential Function Charts (SFC)
Function Block Diagram (FBD)
Structured Text (ST)
Instruction List (IL)
11. Which one of the following is a non-maskable interrupt?
A. RST 7.5
B. RST 6.5
C. RST 5.5
D. TRAP

Ans. D
Sol. TRAP is the non-maskable interrupt of microprocessor.
12. A balanced modulator is used for generation of which of the following?
A. DSB-SC signal
B. FM signal
C. PM signal
D. PAM signal

Ans. A
Sol. Balanced modulator is used for generation of DSB-SC signal.
13. $A$ FM wave is give as $v=12 \sin \left(6 \times 10^{8} t+\sin 1250 t\right)$. Its carrier frequency is
A. 60.0 MHz
B. 95.5 MHz
C. 125.0 MHz
D. 276.3 MHz

Ans. B
Sol. Standard form of FM wave $=\mathrm{A} \sin \left(\omega_{\mathrm{c}} \mathrm{t}+\mathrm{m}_{\mathrm{f}} \sin \omega_{\mathrm{m}} \mathrm{t}\right)$
$\therefore \omega_{c}=6 \times 10^{8}=600 \times 10^{6}$
$2 \pi f_{c}=600 \times 10^{6} \Rightarrow f_{c}=95.5 \mathrm{mHz}$
14. The basic memory cell in a DRAM is a
A. MOSFET
B. Capacitor
C. Capacitor and MOS switch
D. Flip-Flop

Ans. C
Sol. Capacitor along with MOS switch is basic memory cell in DRAM.
15. Which of the following are 3 byte instruction set?
A. MVI A, 32 H
B. JMP 2085 H
C. MOV C, A
D. ADD B

Ans. B
Sol. IMP 2085 is an example of three by be instruction set.
16. In 8085 microprocessors, assume that the Stack Pointer is pointing to memory location 2000 H and registers DE contains 1050 H . After the execution of instruction PUSH D, the Stack Pointer would be pointing at:
A. 2000 H
B. 1 FFDH
C. 1FFEH
D. 1FFFH

Ans. C
Sol. After the execution of instruction PUSH D $S P \rightarrow$ SP - 2, stack pointer would be 1FFEH.
17.The result of the following 8086 assembly language program is:

MOV AX, BB11H
MOV CX, 1122H
ADD AX, CX
HLT
A. $\mathrm{CX}=\mathrm{BB} 11 \mathrm{H}$
B. $A X=C C 33 H$
C. $A X=B B 11 H$
D. $C X=C C 33 H$

Ans. B
Sol. MOV AX, BB11H :- A->[BB11H]
MOV CX, 1122H :- C $->[1122 \mathrm{H}]$
ADD AX, CX :- A = A+C;
So, $A X=C C 33 H$
18. In 8085 microprocessor the first machine cycle of every instruction is:
A. Opcode Fetch Cycle
B. Memory Read Cycle
C. Memory Write Cycle
D. I/O Read Cycle

Ans. A
Sol. In 8085 microprocessor the first machine cycle of every instruction is Opcode Fetch Cycle.
19. Out of the following hardware interrupts in 8085 which has got the least priority?
A. TRAP
B. RST 7.5
C. RST 6.5
D. RST 5.5

Ans. D
Sol. The hardware interrupt in 8085 microprocessor that has least priority is RST 5.5.
20. How many flip-flops are required to build a binary counter circuit to count from 0 to 1023?
A. 1
B. 6
C. 10
D. 23

Ans. C
Sol. A binary counter with $n$ bit \& can Count from 0 to $2^{n}-1$. For an $n$ bit counter $n$ flip flops are Required. So, 0 to 1023( $2^{10}-1$ ).
$\therefore \mathrm{n}=10$
21. The number of NAND gates required to implement a function $A+A \bar{B}+A \bar{B} C$ is equal to
A. Zero
B. 1
C. 4
D. 5

Ans. A
Sol. $A+A \bar{B}+A \bar{B} C=A$
$\therefore$ No NAND gates are required.
22. In a positive edge triggered JK flip-flop, $\mathrm{J}=1, \mathrm{~K}=0$ and clock pulse is rising, Q will be
A. 0
B. 1
C. showing no change
D. toggle

Ans. B
Sol. for edge triggered J-K flip flop
for $\mathrm{J}=1, \mathrm{k}=0$, out will set to ' 1 ', at raising edge of clock cycle.
23.Output $X$ in the circuit is:

A. $X=A \bar{C} D+\bar{A} B C$
B. $X=A C \bar{D}+A \bar{B} C$
C. $X=A C \bar{D}+\bar{A} B C$
D. $X=A C \bar{D}+\overline{A B C}$

Ans. C
Sol.


So, $X=X^{\prime}+X^{\prime \prime}=A C^{\bar{D}}+\bar{A}_{B C}$
Output $X$ in the circuit is $X=A C \bar{D}+\bar{A}_{B C}$.
24. An 8 -bit DAC produces an out voltage of 1 V for a digital input of 00110010. Determine the largest value of the output voltage from the DAC .
A. 12.75 kV
B. 5.1 V
C. 255 V
D. 20 mV

Ans. B

Sol. Largest value of 8 -bit digital input is $11111111=(255)_{10}$
For digital input of 00110010: (55) $10=$ output is 1 V
So for digital input is 11111111: (255) $)_{10}=\frac{255}{50} \times 1=5.1 \mathrm{~V}$
25. Which of the following is equivalent to the Boolean function $X+X Y$ ?
A. 0
B. $Y$
C. X
D. 1

Ans. C
Sol. $X+X Y=X .(1+Y)=X .1=X$
26.T he step angle of the stepper motor is $2.5^{\circ}$. If the stepping frequency is 3600 pulses per second, then the shaft speed will be
A. 144 rps
B. 3600 rps
C. 25 rps
D. 2.5 rps

Ans. C
Sol.

$$
\begin{aligned}
n & =\beta \times f / 360^{\circ} \\
& =2.5 \times 3600 / 360^{\circ} \\
& =25 \mathrm{rps}
\end{aligned}
$$

27. A shaded pole induction motor does not have the advantage of
A. Rugged construction
B. Low initial as well as maintenance cost
C. High starting torque
D. Comparatively small starting current

Ans. C
Sol. high losses, poor power factor and low starting torque are key features of shaded pole IM hence they are used in small applications.
28. Which of the following motors is used in household refrigerators?
A. AC series motor
B. DC shunt motor
C. Reluctance motor
D. Single phase induction motor

Ans. D
Sol. Single phase induction motor is used in household refrigerators.
29. A 2-phase, 4-phase permanent magnet stepper motor has a step of:-
A. $90^{\circ}$
B. $45^{\circ}$
C. $30^{\circ}$
D. 22

Ans. A
Sol. $\Delta \theta=$ Step $=\left(\frac{\mathrm{N}_{\mathrm{S}}-\mathrm{N}_{\mathrm{r}}}{\mathrm{N}_{\mathrm{S}} \times \mathrm{N}_{\mathrm{r}}}\right) \times 360^{\circ}=\left(\frac{4-2}{4 \times 2}\right) \times 360^{\circ}$
$\Delta \theta=90^{\circ}$
30. AC servo-motor is basically a
A. Capacitor motor
B. Two phase motor
C. Three phase motor
D. Universal motor

Ans. B

Sol. Two phase induction motor
31. At a slip of 4\%, maximum possible speed of a 3-phase squirrel cage induction motor is
A. 2880 rpm
B. 3000 rpm
C. 1500 rpm
D. 1440 rpm

## Ans. A

Sol. At a nominal frequency of 50 Hz and assuming a two-pole machine for maximum speed

$$
\begin{aligned}
& N r=N s *(1-s) \\
& \quad N s=120 f / P \\
& =120(50) / 2 \\
& =3000
\end{aligned}
$$

With 4\% slip
$\mathrm{Nr}=3000 *(1-0.04)=2880 \mathrm{rpm}$
32. If the supply frequency of a 3-phase induction motor is ' $f$ ', then frequency of rotor emf at motor slip 's' will be
A. sf
B. $(1-s) f$
C. f/s
D. None of these

Ans. A
Sol. If the supply frequency of a 3-phase induction motor is ' $f$ ', then frequency of rotor emf at motor slip 's' will be sf.
33. A 3-phase delta connected squirrel cage induction motor when started with DOL starter has s starting torque of 600 Nm . Its starting torque when star-delta is used will be:-
A. 600 Nm
B. 200 Nm
C. 300 Nm
D. 400 Nm

Ans. B
Sol. In DOL $T_{s t}=500 \mathrm{~N}-\mathrm{m}$
In Y-D Starting $(T s t)_{Y-D}=1 / 3(T s t)_{\text {DOL }}$
$=1 / 3 \times 600$
$=200 \mathrm{~N}-\mathrm{m}$
34. In a 3-phase induction motor, the ratio of air-gap power, rotor copper losses and developed mechanical power is respectively:-
A. $(1-s): s: 1$
B. $1:(1-s): s$
C. $s:(1-s): 1$
D. $1: \mathrm{s}:(1-\mathrm{s})$

Ans. D
Sol. Air gap power $=\mathrm{Pg}$
Rator copper $=\mathrm{P}_{\mathrm{cu}}=5 \mathrm{pg}$
Develop mechanical power $=\mathrm{Pm}=(1-\mathrm{s}) \mathrm{Pg}$
$\mathrm{Pg}: \mathrm{sPg}:(1-\mathrm{s}) \mathrm{Pg}=(1):(\mathrm{s}):(1-\mathrm{s})=1: \mathrm{s}:(1-\mathrm{s})$
35. The maximum starting torque of a 3-phase induction motor occurs when:
A. rotor resistance is $3 / 4$ th of the rotor reactance
B. rotor resistance is $1 / 4$ th of rotor reactance
C. rotor resistance is $1 / 2$ th of rotor reactance
D. rotor resistance is equal to rotor reactance

Ans. D
Sol. We know that $T_{\text {st }}=\frac{3 \times 60}{2 \pi N_{s}} \frac{E_{2}^{2} R_{2}}{\left(R_{2}^{2}+X_{2}^{2}\right)}$
For max starting Torque, $\frac{\mathrm{dT}_{\text {st }}}{\mathrm{dR}}=0$
After solving this, we get, $\mathrm{R}_{2}=\mathrm{X}_{2}$
36. A 3 phase induction motor runs at almost 1000 rpm at no load and 950 rpm at full load when supplied with power from a 50 Hz 3 phase line. The frequency of rotor voltage is:
A. 2 Hz
B. 2.5 Hz
C. 250 Hz
D. 2.25 Hz

Ans. B
Sol.
Rotor Frequency $\mathrm{f}_{r}=\left(\frac{N_{s}-N_{m}}{N_{s}}\right) \times f_{s}$
Rotor Frequency $\mathrm{f}_{r}=\left(\frac{1000-950}{1000}\right) \times 50$
Rotor Frequency $\mathrm{f}_{r}=2.5 \mathrm{~Hz}$
37. The type of noise reduced by limiters in FM receivers is
A. Avalanche noise
B. Burst noise
C. Narrow band-pass noise
D. Impulse noise

Ans. D
Sol. if two or more signals are received at the same time, a high performance limiter stage can greatly reduce the effect of the weaker signals on the output. This is commonly referred to as the $\mathbf{F M}$ capture effect. The limiter also reduces the effect of impulse noise spikes.
38. Bandwidth occupied by 100 MHz carrier, AM modulated by signal frequency of 10 kHz is
A. 100 MHz
B. 20 kHz
C. 10 kHz
D. 110 MHz

Ans. B
Sol. The bandwidth required for amplitude modulation is twice the frequency of the modulation signal.
$B W=2 f_{m}=2 \times 10=20 \mathrm{kHz}$
39. If the frequency deviation is 30 KHz and modulating signal is 5 KHz . Calculated percent modulation
A. $200 \%$
B. $600 \%$
C. $100 \%$
D. $350 \%$

Ans. B
Sol. Percent modulation $=\frac{\Delta f}{f_{m}} \times 100=30 / 5 \times 100=600 \%$
40. If a signal is modulated to the frequency of 2 MHz , calculate the required length of antenna if $\lambda / 2$ dipole is used at the transmitter
A. 100 m
B. 75 m
C. 175 m
D. 125 m

Ans. B
Sol. $\mathrm{f}=2 \mathrm{MHz}$
$\mathrm{L}=\frac{\lambda}{2}$
$=\frac{C}{f \cdot 2}$
$=\frac{3 \times 10^{8}}{2 \times 10^{6} \times 2}$
$\mathrm{L}=75 \mathrm{~m}$
41. If the total voltage in the Am wave is 5.196 V and modulation index is 0.4 then the carrier voltage before modulation is $\qquad$ V
A. 2.43 V
B. 4.345 V
C. 5 V
D. 3.45 V

Ans. C
Sol. $V_{t}=5.196, \mu=0.4$
$V_{t}=V_{c} \sqrt{1+\frac{\mu^{2}}{2}}$
$5.196=V_{c} \sqrt{1+\frac{(0.4)^{2}}{2}}$
$\therefore \mathrm{V}_{\mathrm{c}}=5 \mathrm{~V}$
42. $A M$ broadcast station transmits modulating frequency of 6 KHz . If transmitting frequency is 810 KHz , then maximum and minimum frequency in the AM will be
A. 826 KHz and 804 KHz
B. 816 KHz and 804 KHz
C. 916 KHz and 904 KHz
D. 822 KHz and 816 KHz

## Ans. B

Sol. Given $F_{s}=810 \mathrm{KHz}, \mathrm{F}_{\mathrm{m}}=6 \mathrm{KHz}$
AM has highest frequency $=\mathrm{F}_{\mathrm{s}}+\mathrm{F}_{\mathrm{m}}=816 \mathrm{KHz}$
AM has minimum frequency $=F_{s}-F_{m}=804 \mathrm{KHz}$
43. Unit of the reluctance is $\qquad$ ?
A. ohms
B. $A / m$
C. henry $^{-1}$
D. weber per ampere-turns

Ans. C
Sol.
Reluctance $R_{L}=\frac{m m f}{\text { flux }}$
$R \mathrm{~L}=$ ampere-turn per weber
ohm is unit of resistance.
Unit of magnetic field strength $H=A / m$
Unit of reluctance is ampere turn per weber or $\mathrm{H}^{-1}$ [hennery] ${ }^{-1}$
44. For a Diamagnetic Material which of the following is correct ?
A. Susceptibility is directly proportional to the temperature
B. Susceptibility is inversely proportional to the temperature
C. Susceptibility is independent of temperature
D. None of these

Ans. C
Sol. For diamagnetic material

$\chi_{m}=-1$ and it is independent of temperature
45. If $A \neq B$, then the given Boolean expression results the minimized form, $f(A, B)=\overline{(\overline{\bar{A}+B})+(\overline{A+\bar{B}})}+\overline{(\overline{A B})(A \bar{B})}$
A. 1
B. $A B$
C. 0
D. $A \odot B$

Ans. A
Sol.
$(A, B)=(\overline{\overline{\bar{A}}+B})+(\overline{A+\bar{B}})+(\overline{\bar{A} B)(A \bar{B})}$
$=\{\overline{\overline{\bar{A}, B})} \cdot \overline{\overline{(A+\bar{B}})}\}+\{\overline{\overline{(A B})}+\overline{(A \bar{B})}\}$

$$
\begin{aligned}
& =\{(\overline{\mathrm{A}}+\mathrm{B}) \cdot(\mathrm{A}+\overline{\mathrm{B}})\}+\{(\overline{\mathrm{A}}+\overline{\mathrm{B}})+(\overline{\mathrm{A}}+\overline{\mathrm{B}})\} \\
& =\mathrm{A} \odot \mathrm{~B}+1 \\
& =1
\end{aligned}
$$

46. Recently SIDBI collaborated with which state government for development of MSMEs?
A. Manipur
B. Tripura
C. Assam
D. Nagaland
E. Arunachal Pradesh

Ans. C
Sol. * The Small Industries Development Bank of India (SIDBI) has participated in a special event held at the Administrative Staff College, Guwahati, Assam, to strengthen the state co-operation.
47. With which country India has signed a three-year Work Program for development in Agriculture cooperation?
A. France
B. Japan
C. Israel
D. Germany
E. Canada

Ans. C
Sol. • India \& Israel have signed a three-year 5th Indo-Israel Agriculture Action Plan (IIAP) 2021-23 agreement for development in Agriculture cooperation.

- Under the work program, both countries will implement two initiatives namely 'IndoIsrael Agricultural Project Centre of Excellence' \& 'Indo-Israel Villages of Excellence (IIVoE)'.
- It will benefit local farmers both through the Centers of Excellence and the Villages of Excellence.
- Under the IIAP, 29 CoEs have been established across India in 12 states.
- The COEs established under these Israeli-based action plans are playing an important role in doubling farmers' income.
- The exchange of technology between India and Israel will greatly improve the productivity and quality of horticulture.

48. First batch of Multi-Mode Hand Grenades (MMHG) has been handed over to Indian Army in Nagpur, Maharashtra. The MMHG is manufactured by $\qquad$ .
A. BEML Limited
B. Economic Explosives Limited (EEL)
C. Bharat Dynamics Limited
D. Bharat Electronics Limited
E. Bharat Heavy Electricals Limited

Ans. B
Sol. * First batch of Multi-Mode Hand Grenades (MMHG) has been handed over to Indian Army in Nagpur, Maharashtra

* MMHG is manufactured by Economic Explosives Limited (EEL), following Transfer of Technology from Terminal Ballistics Research Laboratory of DRDO
* Grenade is lethal, safer and has a distinctive design that gives flexibility of employment in both defensive (fragmentation) and offensive (stun) modes.
* It has a highly accurate delay time, very high reliability in usage and safe for carriage.

49. Defence Research and Development Organisation (DRDO) has handed over the first deliverable Firing Unit (FU) of Medium Range Surface to Air Missile (MRSAM) System to Indian Air Force (IAF). The missile has been jointly developed by DRDO and which aerospace manufacturer?
A. Israel Aerospace Industries
B. Lockheed Martin Corporation
C. The Boeing Company
D. MBDA
E. Airbus Group

Ans. A
Sol. - Defence Research and Development Organisation (DRDO) has handed over the first deliverable Firing Unit (FU) of Medium Range Surface to Air Missile (MRSAM) System to Indian Air Force (IAF).

- MRSAM is an advanced network centric combat Air Defence System. It was jointly developed by DRDO and Israel Aerospace Industries (IAI) in collaboration with Indian industry consisting of private and public sectors as well as MSMEs. It is a surface-to-airmissile, 4.5m in length. Contract for MRSAM programme was signed in February 2009. Under the contract, IAF was to buy 450 MRSAMs and 18 firing units at the value of $\$ 2 b n$.

50. Which act ended the "Trade Monopoly" of the East India Company?
A. Regulating Act of 1773
B. Pitt's India Act of 1784
C. The Charter Act of 1833
D. The Charter Act of 1813

Ans. D
Sol. It was the charter act of 1813 that ended the "Trade Monopoly" of the East India Company. However the company was allowed to continue their monopoly over the tea trade and the trade with China.
51. Apart from the Himalayan region, the forest soils occur which of the following?
A. Western Ghats
B. Eastern Ghats
C. Southern Ghats
D. Both A and B

Ans. D
Sol. Apart from the Himalayan region, the forest soils occur on Western and Eastern Ghats as well as in some parts of the Peninsular plateau.
52. In which year was Nationalist Congress Party (NCP) founded?
A. 1949
B. 1999
C. 1972
D. 1997

Ans. B
Sol. Nationalist congress party was founded on 25 may 1999. Its youth wing is the nationalist youth congress. Sharad pawar, P.A. Sangma and Tariq Anwar were the three leaders who were involved. Sharad Pawar was made the president and P.A. Sangma and Tariq Anwar
were made the General Secretaries of NCP. NCP was declared as a National party by the Election commission of India.
53. Which of the following is related to Saffron Energy Revolution ?
A. Milk
B. Petroleum
C. Solar Energy
D. Fish Production

Ans. C
Sol. The 'Saffron Energy Revolution' is related to promotion and better utilisation of Solar Energy.

- The Saffron Revolution that focuses on renewable energy sources such as solar energy.
- This Revolution was announced by Prime Minister Narendra Modi in June, 2014.
- Its aimed at making India a solar energy hub and offered its cooperation in the renewable energy sector.

54. Where does the Tricarboxylic acid cycle, take place?
A. Mitochondria
B. Centrosome
C. Centrioles
D. Vacuoles

Ans. A
Sol. Tricarboxylic acid cycle takes place in the mitochondria. Tricarboxylic acid cycle, which is TCA cycle also called Krebs cycle and citric acid cycle. The second stage of cellular respiration and the three-stage process by which living cells break down organic fuel molecules in the presence of oxygen to harvest the energy they need to grow and divide. In the cytoplasm, Glycolysis takes place. Within the mitochondrion, the citric acid cycle occurs in the mitochondrial matrix, and oxidative metabolism occurs in the internal folded mitochondrial membranes (cristae).
55. Which of the following districts come under Devipatan Division of Uttar Pradesh?
A. Bahraich, Gonda, Balarampur, Shravasti
B. Balarampur, Basti, Sant kabir Nagar, Shravasti
C. Shravasti, Gonda , Santkabir Nagar, Balrampur D. Gonda, Bahraich Santkabir Nagar, Shravasti

Ans. A
Sol. In Uttar Pradesh state of India, Devipatan division is an administrative geographical unit. Gonda is headquarters of this division. It consists -
1)Gonda,
2)Bahraich,
3)Shravasti, and
4) Balarampur.
56. In which of the following districts of Uttar Pradesh is Ayodhya, the birth place of Ram situated?
A. Varanasi
B. Meerut
C. Faizabad
D. Kanpur

Ans. C

Sol. Ayodhya is also known as Saketa, is an ancient city of India, believed to be the birthplace of Rama and setting of the epic Ramayana. It is adjacent to Faizabad city in the central region of the Indian state of Uttar Pradesh. Ayodhya used to be the capital of the ancient Kosala Kingdom. It has an average elevation of 93 meters ( 305 feet).
57. Who is the Minister of Power in Uttar Pradesh Government?
A. Dinesh Sharma
B. Dharmpal Singh
C. Shrikant Sharma
D. Jai Pratap Singh

Ans. C
Sol. Shrikant Sharma is an Indian politician from the BJP. He is a Member of the Uttar Pradesh Legislative Assembly from Mathura Constituency in Mathura district. He was sworn in as a Minister of Power in Yogi Adityanath cabinet. He is also the head of Bharatiya Janata Party National Secretary.
58. Which district of Uttar Pradesh is going to get India's first freight village?
A. Kannauj
B. Varanasi
C. Bijnor
D. Mainpuri

Ans. B
Sol. India's first 'freight village' will be developed by the Inland Waterways Authority of India (IWAI) in Varanasi, Uttar Pradesh. The freight village, a one-of-its-kind infrastructure platform, will attract companies that require logistics services and can cluster to improve their competitiveness. This will allow relocation of retailers, warehouse operators and logistics service providers supplying the regional FMCG market. The facility will come around the proposed multi-modal terminal adjacent to the city on the banks of the Ganga.
59. Direction: Select the one which is different from the other three responses.
A. 704,11
B. 256,4
C. 832,13
D. 310,5

Ans. D
Sol. $704 \div 11=64$
$256 \div 4=64$
$832 \div 13=64$
But, $310 \div 5=62$
Thus, the odd one is $310,5$.
Hence, option D is correct.
60. 5 kg of Rice at Rs. 4 per kg is mixed with 10 kg of rice at Rs. 5 per kg . find the average price of the mixture.
A. 3.6
B. 5.8
C. 6.4
D. 4.6

Ans. D
Sol. Let the average price of the rice be $x$, Then,


$$
\begin{aligned}
& (5-x)=(x-4) \\
& \rightarrow(5-x) /(x-4)=5 / 10 \\
& \rightarrow 50-10 x=5 x-20 \\
& \rightarrow 70=15 x \\
& \rightarrow x=4.66
\end{aligned}
$$

