- Pediatrics → 7am ✓
- 15th → Pharmac + anesth.

5:30pm

PSM PYQ
UPSC CMS + NPG
NUMERICALS

Medsynapse by Dr. Nikita

Which one of the following is defined as "the average number of children a woman would have if she were to pass through her reproductive years, bearing children at the same rates as the women now in each age group" ?

(a) Age-Specific Fertility Rate (ASFR)

(b) General Fertility Rate (GFR)

(c) Net Reproduction Rate (NRR)

(d) Total Fertility Rate (TFR)

General fertility rate (GFR): Annual number of live births per 1000 women of childbearing age (15–49 years old, or 15–44 years old)

General marital fertility rate (GMFR): Annual number of live births per 1000 married women of childbearing age (15–49 years old, or 15–44 years old) mid-year population

Age-specific fertility rates (ASFR): Annual number of live births per 1000 women in particular age groups (usually age 15–19 years, 20–24 years etc)

Total fertility rate (TFR): Number of live births per woman completing her reproductive life, if her childbearing at each age reflected current ASFRs.

Gross reproduction rate (GRR): Number of daughters who would be born to a woman completing her reproductive life at current ASFRs.

Net reproduction rate (NRR): Expected number of daughters, per newborn prospective mother, who may or may not survive to and through the ages of childbearing.

Crude birth rate (CBR): Annual number of live births per 1000 mid year population

Crude death rate (CDR): Annual number of deaths per 1000 mid year population

Infant mortality rate (IMR): Annual number of deaths of children less than 1 year old per 1000 live births

Which among the following is correct about yellow fever vaccination requirement for international travellers ?

1. Term of validity of the certificate is changed from 10 years to the duration of the life of the vaccinated person, some years ago.

2. Lifetime validity of the certificate applies automatically to all existing and new certificates.

3. Validity of the certificate begins 4 days after vaccination.

4. In India, booster dose of yellow fever vaccine is required for those whose certificate is prior to the year 2016.

Select the correct answer using the code given below :

(a) 1 and 2

(b) 1 and 3

(c) 2 and 3

(d) 2 and 4

yellow f vaccine
CI in
: egg allergy
• ADR → hepatic
• 17D

The 'Nalgonda Technique' developed by the National Environmental Engineering Research Institute (NEERI) was developed primarily for the removal of which one of the following from water ?

(a) Asbestos

(b) Fluorine

(c) Chlorine

(d) Iron

LAB

lime

alum m.imp.

bleaching powder

Flurosis

- dental discolour.n
- skeletal → Osteosclerosis
  - interosseous memb.

- (N) → upto 1.5

Chlorine

0.5 drink

1 swim.

2 guinea worm

Disaster 0.7

Nalgonda Technique' has been developed by National Environmental Engineering Research Institute (NEERI), Nagpur for defluoridation of water. It involves 'addition of lime, alum and bleaching powder' followed by flocculation, sedimentation and filteration. In Nalgonda technique, aluminium is major de-fluoridating agent.

Water contamination with high content of which chemical can lead to methaemoglobinaemia ?

(a) Cyanide

(b) Nitrate

(c) Fluoride

(d) Sulphide

remote contamin

away

nitrite → recent

immediate

R_x → vit C

+ methylene blue.

Fe^{3+} in heme

↓ saturn O_2

Fecal → e.coli

remote → perfringes.

recent → se strepto.

The expected outcome of Government of India's initiative 'SUMAN' is :

(a) Zero preventable maternal and newborn deaths

(b) Limit preventable maternal and newborn deaths to between 0·5 – 1%

(c) Limit preventable maternal and newborn deaths to between 1 – 2%

(d) Limit preventable maternal and newborn deaths to between 2 – 5%


Government of Assam
National Health Mission, Assam
SURAKSHIT MATRITVA AASHWASAN
Promoting Zero Preventable Maternal & Newborn Death
Surakshit Matritva Aashwasan (SUMAN) can only be successful with your help.
Be vigilant and report maternal death
An incentive of Rs.1000/- will be entitled to the person who first reports maternal death.
For payment of incentives, only deaths taken place in the community/home will be considered.
The mode of reporting shall only be through 104.
Any person can dial 104 to inform maternal death.
Assured Services under SUMAN includes
Ambulance & referral services (102 or 108)
Minimum 4 antenatal check-ups
Normal delivery or through C- section
Medicines, diagnostic tests & blood services to mothers (during pregnancy, during delivery, after delivery till six months) and for baby up to 1 year.
Proper care with respect and dignity
Grievance redressal mechanism (toll free no. 104)

Which food proteins among the following are considered to be the best and are used in nutritional studies as 'reference protein'?

(a) Milk proteins

(b) Egg proteins

(c) Wheat proteins

(d) Legume proteins

NPU → 96

protein quality → DIAAS.

Net Protein Utilization (NPU): Provides a complete expression of 'protein quality'

$$\text{NPU} = \frac{\text{Nitrogen retained by body}}{\text{Nitrogen intake}} \times 100$$

Eg - egg

$$\text{NPU} = \frac{\text{Biological value} \times \text{Digestibility coefficient}}{100}$$

What is the correct increasing order of minimum age at which the following vaccines are administered to a child, as part of the National Immunization Schedule (NIS) after birth of child ?

1. BCG vaccine
2. Japanese Encephalitis (JE) vaccine
3. Rotavirus vaccine
4. Tetanus and adult diphtheria (Td) vaccine

Select the correct answer using the code given below :

(a) 1 → 2 → 3 → 4

(b) 1 → 3 → 2 → 4

(c) 2 → 3 → 4 → 1

(d) 3 → 1 → 4 → 2

For Pregnant Women

Vaccine	When to give	Dose	Route	Site
Td-1	Early in pregnancy	0.5 ml	Intra-muscular	Upper Arm
Td-2	4 weeks after Td-1*	0.5 ml	Intra-muscular	Upper Arm
Td- Booster	If received 2 Td doses in a pregnancy within the last 3 yrs*	0.5 ml	Intra-muscular	Upper Arm

For Infants

Vaccine	When to give	Dose	Route	Site
BCG	At birth or as early as possible till one year of age	0.1ml (0.05ml until 1 month age)	Intra-dermal	Left Upper Arm
Hepatitis B - Birth dose	At birth or as early as possible within 24 hours	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
OPV-0	At birth or as early as possible within the first 15 days	2 drops	Oral	Oral
OPV 1, 2 & 3	At 6 weeks, 10 weeks & 14 weeks (OPV can be given till 5 years of age)	2 drops	Oral	Oral
Pentavalent 1, 2 & 3	At 6 weeks, 10 weeks & 14 weeks (can be given till one year of age)	0.5 ml	Intra-muscular	Antero-lateral side of left mid-thigh
Rotavirus	At 6 weeks, 10 weeks & 14 weeks (can be given till one year of age)	5 drops	Oral	Oral
PCV	At 6 weeks, & 14 weeks (Can be given till one year of age)	0.5 ml	Intra-muscular	Antero-lateral side of right mid-thigh
IPV	Two fractional dose at 6 and 14 weeks of age	0.1 ml	Intradermal	Right upper arm
MR 1st Dose	9 completed months-12 months, (can be given till 5 years of age)	0.5 ml	Sub-cutaneous	Right upper Arm
PCV booster	9 completed months-12 months.	0.5 ml	Intra-muscular	Antero-lateral side of right mid-thigh
JE - 1**	9 completed months-12 months.	0.5 ml	Intra-muscular	Antero-lateral side of left mid-thigh
Vitamin A (1st dose)	At 9 completed months with measles- Rubella	1 ml (1 lakh IU)	Oral	Oral

For Children

Vaccine	When to give	Dose	Route	Site
DPT booster 1	16-24 months	0.5 ml	Intra-muscular	Antero-lateral side of left mid thigh
MR 2nd dose	16-24 months	0.5 ml	Sub-cutaneous	Right upper Arm
OPV Booster	16-24 months	2 drops	Oral	Oral
JE-2	16-24 months	0.5 ml	Intra-muscular	Antero-lateral side of left mid-thigh
Vitamin A*** (2nd to 9th dose)	16-24 month with MR and remaining at an interval of 6 months up to the age of 5 yrs	2 ml (2 lakh IU)	Oral	Oral
DPT Booster-2	5-6 years	0.5 ml.	Intra-muscular	Upper Arm
Td	10 years & 16 years	0.5 ml	Intra-muscular	Upper Arm

- *Give Td-2 or Booster doses before 36 weeks of pregnancy. However, give these even if more than 36 weeks have passed. Give Td to a woman in labour, if she has not previously received Td.
- **JE vaccine is in selected endemic districts
- *** The 2nd to 9th doses of Vitamin A can be administered to children 1-5 years old during biannual rounds, in collaboration with ICDS.

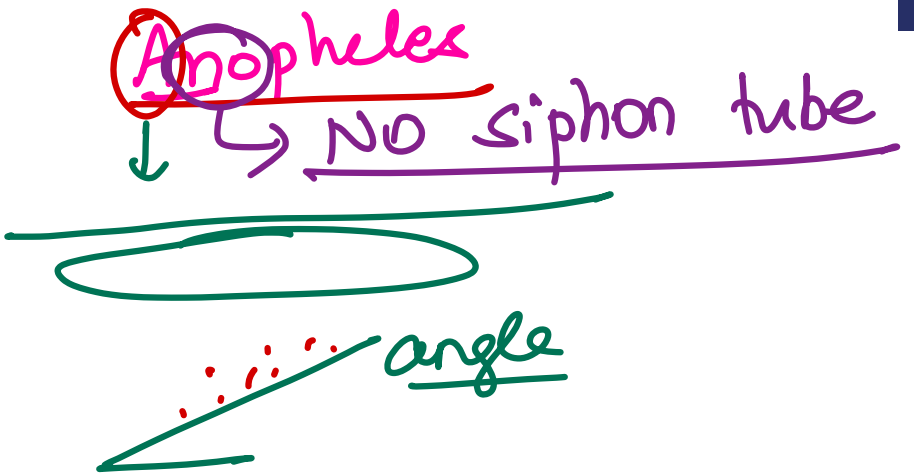
A water body was inspected to look for the presence of mosquito eggs. It was observed that there were boat-shaped eggs, laid singly, not in clusters. The eggs also had lateral floats. Which one of the following diseases is most likely to be spread by the mosquito whose eggs were found ?

(a) Chikungunya fever → aydecz

(b) Dengue fever → aydecz

(c) Japanese encephalitis → culex

(d) Malaria ✓



A anoph A aedes → sigle eggs.
kt floats ⊕

• Dubly Ag → P. vivax

. Which of the following mosquito-borne diseases are transmitted chiefly by Aedes mosquito ?

1. Dengue
2. West Nile fever → Japanese → Culex
3. Yellow fever
4. Zika fever

AYDEC:Z — YF, Dengue, CK, zika.

Select the correct answer using the code given below :

(a) 1 and 3 only

(b) 1, 2 and 3

(c) 1, 3 and 4 ✓

(d) 2 and 4 only

Which one among the following is best defined as the interval of time between receipt of infection by a host and maximal infectivity of that host ?

(a) Generation time

(b) Latent period

(c) Incubation period

(d) Serial interval

Consider the following vaccines :

1. BCG Vaccine
2. Hepatitis B Vaccine
3. Inactivated Polio Vaccine (IPV)
4. Oral Polio Vaccine (OPV)

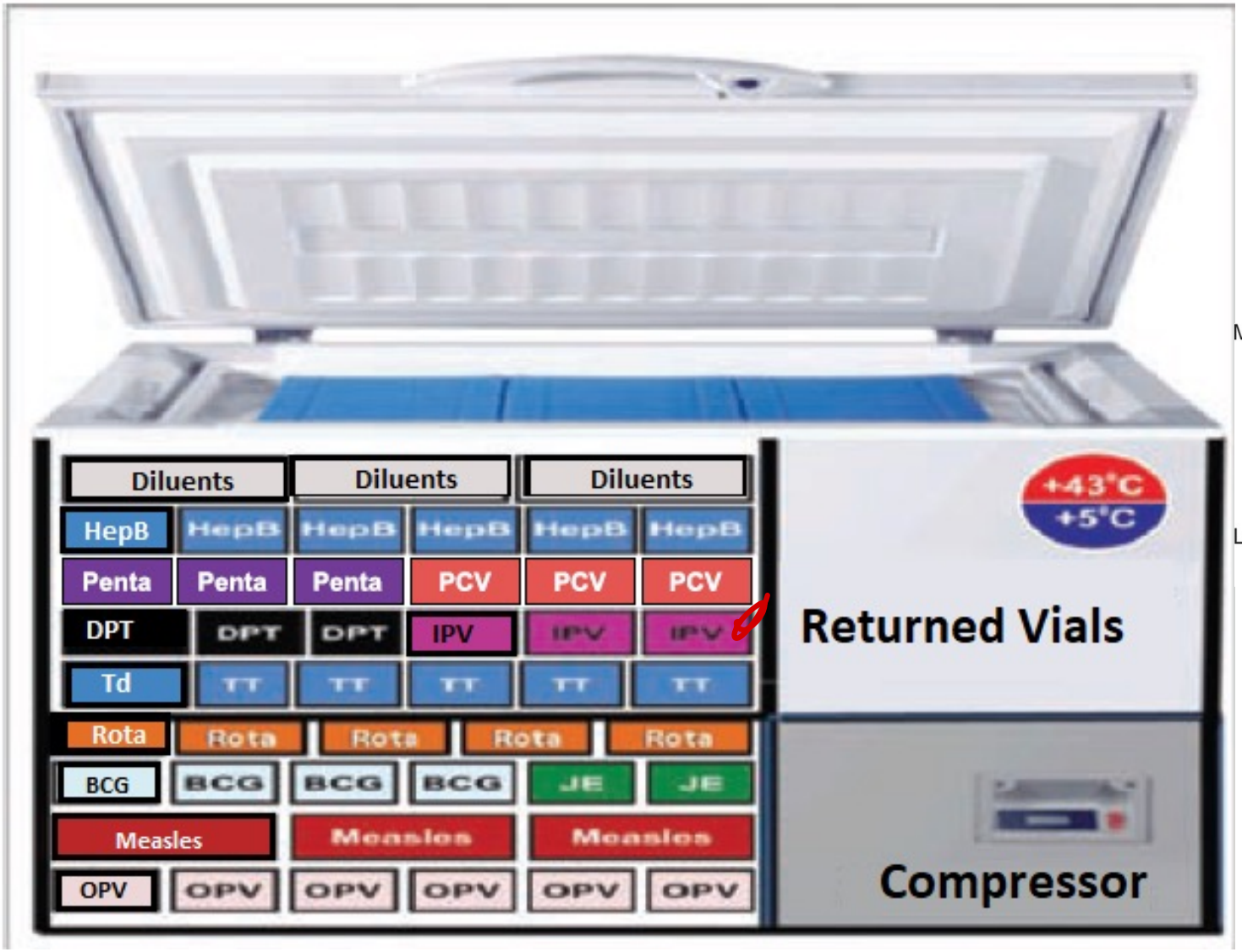
What is the correct order of the above vaccines as per their sensitivity to heat (most sensitive to least sensitive) given in the National Immunization Schedule (NIS) ?

(a) $4 \rightarrow 3 \rightarrow 2 \rightarrow 1$

(b) $2 \rightarrow 1 \rightarrow 3 \rightarrow 4$

(c) $2 \rightarrow 1 \rightarrow 4 \rightarrow 3$

(d) $4 \rightarrow 3 \rightarrow 1 \rightarrow 2$



Most sensitive

Least sensitive

- OPV
- IPV, Measles, MR, MMR Rotavirus vaccine
- DTP, DTP-HepB, DTP-Hib, DTP-Hib,YF
- BCG, JE
- Hib, DT
- Td, TT, HepB
- MenA

What is the amount of bleaching powder required to disinfect 455 litres of water if the 4th, 5th, and 6th cups of a Horrock's apparatus show distinct blue color?

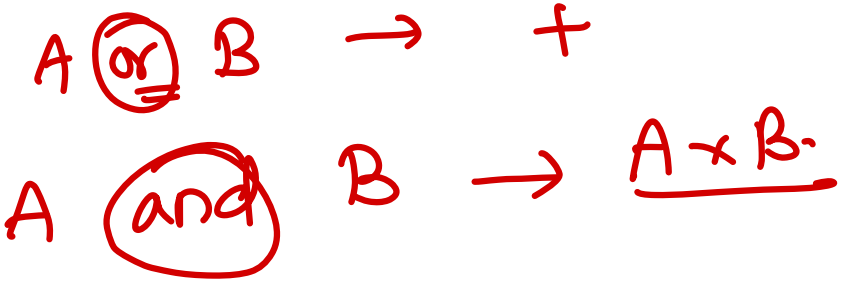
A. 2 grams
B. 4 grams
C. 8 grams
D. 6 gms

n x 2 → first cup showing blue color.

4 x 2 = 8

If the events A and B are mutually exclusive events, what is the probability of either A or B occurring?

A. p (A) + p (B)
B. p (A) x p (B)
C. p (A)+ p(B) –P (A and B)
D. 1- [pA +Pb]



In a study, group A received placebo while group B received a new drug. In group A, 36 deaths were reported out of a sample of 120. In group B, 26 deaths were reported out of a sample size of 130. How many patients should be treated to avert 1 death?

A. 100

B. 10

C. 250

D. 160

= NNT No needed to treat

$= \frac{1}{ARR}$

absolute risk reduction (subtrn)

placebo → 30%

drug → 20%

ARR = 30 − 20 = 10

$\frac{1}{10} \times 100$

How to Calculate NNT

Find results of study.

↓

Find the rate in the control group.

↓

Find the rate in the treatment group.

↓

Subtract the treatment group rate from the control group rate (ignore a minus sign, if present), and divide the result into 100.

Example

In a trial of cholesterol lowering over five years, 8 percent of patients died in the treatment group, and 12 percent died in the control group.

↓

Control group rate: 12 percent

↓

Treatment group rate: 8 percent

↓

Difference: 4 percent

NNT = 100/4 = 25

A case-control study was done among 500 lung cancer patients and 400 controls. The study groups had 400 and 50 smokers respectively. Calculate the odds ratio.

A. 2.8
B. 0.28
C. 0.20
D. 28

OR in case control
odds ratio . cancer

$$\frac{++ \times --}{+- \times -+}$$

$$\frac{4 \quad 7}{400 \times 350} \Big/ \frac{}{100 \times 50}$$

	D+	D-	
E+ Smoke	400 ++	50	
-	100	350 --	
	500	400	

A village has a total population of 100,000 with an under-16 population at 3%. The prevalence of goitre in the under-16 population is (0.3/100). What is the total number of under-16 population affected by goitre?

A. 90
B. 9
C. 10
D. 100

0.3 100
? 3000

$\frac{3000 \times 0.3}{100}$

In a town, there were 2500 live births in a period of 6 months. During the same period, 15 women died due to the following causes - Peripartum infection – 5 , electrocution – 5 , obstructed labour – 2 , PPH – 3 . What is the maternal mortality ratio?*

A. 400 per 100000 live births
B. 6 per 1000 live births
C. 40 per 1000 live births
D. 60 per 1000 live births

4 per 1000 LB

$\frac{10}{2500} \times 1000$

★ pregnancy → add 10%

In a given population, 4050 births were recorded over a period of 1 year. Among these, 50 were stillbirths, 50 died in the 1st week of life and 150 died within 8-28 days of life. What is the neonatal mortality rate of this population?

A. 50

B. 12. 5

C. 100

D. 62.5